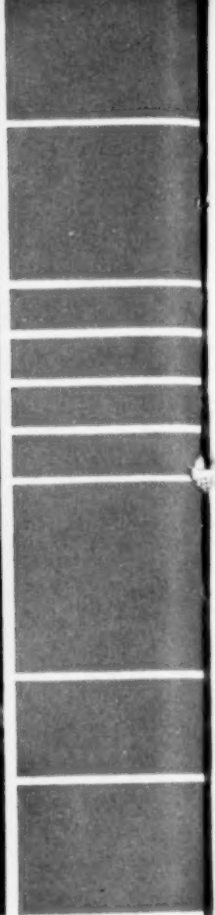


PUBLIC HEALTH REPORTS

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FEDERAL SECURITY AGENCY • Public Health Service



King's Daughters' Hospital

Staunton, Virginia

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Published since 1878

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The 117-bed King's Daughters' Hospital at Staunton, Va. (frontispiece and above), a community hospital built in 1951 with the aid of funds provided through the Federal Hospital Survey and Construction Act, replaced a 61-bed obsolete facility which had been operating at more than capacity under most difficult circumstances. Occupancy in the new building during the first year rose to almost 100 percent. However, the new hospital is planned for expansion: the kitchen, laundry, boiler room, and laboratory could take care of a 75-bed addition with only minor alterations.

As an intermediate hospital, the institution cooperates with the State's medical colleges in their intern and consultant programs. It also extends special services, particularly pathology, to many physicians in nearby communities and to the Waynesboro Community Hospital.

The Augusta - Staunton - Waynesboro Health Department is located in the hospital building, making for easier and closer association in its joint efforts with the hospital.

The hospital has attracted a number of additional physicians to the city and has had no staffing problems except in the nursing department. It has solved this problem, at least to a degree, through a practical nurse training program operated jointly with the local high school. In their senior year, selected applicants complete the academic phases of practical nurse training as approved by the State. They then join the hospital staff for the necessary in-service training. As students they help the professional nursing staff. Some of them remain with the hospital after completion of their training; and some go on to professional nursing schools.

The exterior (above) shows the main hospital building and main entrance, with the wing which houses the health department at the right.

On the frontispiece, one of the nurseries is shown at the upper left. At the center left is another view of the main entrance, and at the lower right a nursing station is shown. (Architects: York & Sawyer. Photographs by Sigurd Fischer.)

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Effect of Fluoridated Public Water Supplies On Dental Caries Prevalence

By FRANCIS A. ARNOLD, JR., D.D.S., H. TRENDLEY DEAN, D.D.S.,
and JOHN W. KNUTSON, D.D.S., Dr.P.H.

SUBSEQUENT to the epidemiological and experimental findings that the use of fluoride waters reduced the prevalence of dental caries, a number of studies were undertaken to evaluate the effects of adjusting the fluoride levels of public water supplies to an optimum concentration, about 1 ppm of fluoride (F). Preliminary and annual reports from these study areas have appeared in the literature from time to time during the past 5 or 6 years (1-9). Essentially, the findings of all these studies are in accord although each has its individual characteristics from a procedural standpoint.

The present paper reports in more detail than a preliminary report (1) the methodology and results of one of these studies, namely, the Grand Rapids-Muskegon study, and includes the results obtained after 6½ years of fluoridation of the Grand Rapids water supply.

Selection of Study Area

Because much of the background data regarding the effects of fluoride waters on dental

caries was obtained in the north central part of the United States, this general area was selected for the fluoridation project. The choice was further influenced by the fact that (a) a considerable amount of data had been obtained on children who had used domestic water supplies for which Lake Michigan was the source, and (b) all evidence suggested that this general area had a high dental caries experience rate (10). Following a careful survey of a number of communities in this area, and with due consideration of the numerous details which influence a project of this sort, the city of Grand Rapids, Mich., was selected for the primary study area. The city of Muskegon, Mich., which has the same source of water and similar treatment procedures as Grand Rapids, was chosen as a control area. To establish what might be termed an "expectancy curve" for this study, a natural fluoride area, the city of Aurora, Ill., was selected. The Aurora water supply contains 1.2 ppm F and has a reliable history of constancy back to 1895 (11).

Base-Line Examinations

Dental examinations were started in Grand Rapids in September 1944. Four trained dental officers performed the examinations in selected schoolrooms, using mouth mirrors and explorers, and standard type examining lights. The examining equipment throughout the study has been a double-end SSW No. 3 explorer and standard plain mirror. The source of light has been a standard E. E. N. T. examination lamp.

Dr. Arnold is associate director in charge of research and Dr. Dean is director of the National Institute of Dental Research, National Institutes of Health, Public Health Service. Dr. Knutson is chief dental officer of the Public Health Service.

Cooperating with the Public Health Service in this study are the Michigan Department of Health and the University of Michigan.

Table 1. Distribution of continuous resident children examined in Grand Rapids and Muskegon, Mich., and in Aurora, Ill., according to age and year of examination

| Age last birthday | 1945 Aurora, Ill. | Basic ex- aminations 1944-45 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 |
|---------------------|----------------------|------------------------------------|-------|------|------|------|------|------|------|
| Grand Rapids, Mich. | | | | | | | | | |
| 4 | 30 | 323 | 540 | 300 | 168 | 137 | 75 | 117 | 168 |
| 5 | 407 | 1,633 | 1,714 | 831 | 886 | 842 | 777 | 720 | 853 |
| 6 | 473 | 1,789 | 1,186 | 628 | 663 | 736 | 697 | 748 | 750 |
| 7 | 516 | 1,806 | 149 | 82 | 69 | 55 | 54 | 438 | 423 |
| 8 | 469 | 1,647 | 15 | 216 | 135 | 138 | 155 | 501 | 470 |
| 9 | 368 | 1,639 | | 525 | 465 | 484 | 519 | 520 | 582 |
| 10 | 397 | 1,626 | | 109 | 108 | 111 | 125 | 131 | 141 |
| 11 | 383 | 1,556 | | 17 | 18 | 22 | 140 | 130 | 151 |
| 12 | 401 | 1,685 | 174 | 85 | 38 | 60 | 130 | 200 | 176 |
| 13 | 401 | 1,668 | 953 | 547 | 625 | 600 | 574 | 530 | 497 |
| 14 | 433 | 1,690 | 273 | 173 | 196 | 152 | 153 | 130 | 128 |
| 15 | 467 | 1,511 | 80 | 53 | 80 | 64 | 64 | 58 | 53 |
| 16 | 371 | 1,107 | 4 | 3 | 233 | 245 | 209 | 177 | 198 |
| Muskegon, Mich. | | | | | | | | | |
| 4 | | 20 | | 43 | 18 | 26 | 51 | 41 | 63 |
| 5 | | 402 | | 321 | 348 | 422 | 340 | 359 | 351 |
| 6 | | 462 | | 339 | 312 | 305 | 393 | 310 | 294 |
| 7 | | 408 | | 36 | 42 | 36 | 30 | 274 | 223 |
| 8 | | 376 | | 18 | 13 | 10 | 12 | 190 | 275 |
| 9 | | 357 | | 213 | 215 | 199 | 197 | 227 | 277 |
| 10 | | 359 | | 62 | 57 | 52 | 52 | 51 | 62 |
| 11 | | 293 | | 12 | 10 | 14 | 146 | 141 | 139 |
| 12 | | 328 | | 21 | 19 | 11 | 28 | 43 | 48 |
| 13 | | 377 | | 197 | 207 | 208 | 214 | 173 | 225 |
| 14 | | 369 | | 77 | 50 | 79 | 66 | 63 | 59 |
| 15 | | 292 | | 18 | 44 | 41 | 34 | 35 | 21 |
| 16 | | 248 | | 1 | 199 | 205 | 132 | 146 | 155 |

Bite-wing X-ray examinations were made of a representative sample of children examined by the different examiners to evaluate, in part, the "examiner error." The result of this evaluation will be the subject of another report. A complete oral examination was made and a residence history obtained, which, for the younger children, was verified by a questionnaire signed by parent or guardian. Only the principal dental findings will be considered here.

The examiner dictated his findings in code to recording scribes. The code used for recording dental conditions is similar to one described previously (12). It is designed to give a complete description of the health status of all teeth and each surface of individual teeth, both separately and collectively. A short "indoctrination" period was used to acquaint the examiners and scribes with the code and to establish consistency among examiners regarding the sub-

jective assessment features of diagnosis. Virtually all pupils of the school systems of the selected cities were examined, including nursery schools and junior college students where available.

Subsequent Annual Examinations

Following the original "prefluoridation" examinations, annual dental examinations have been made in Grand Rapids and Muskegon. These examinations are being conducted in the same manner as were the original ones. There have been changes in dental examiners with the exception of one officer who has participated in each series of examinations. Each new examiner has been calibrated against this one officer to standardize diagnostic criteria.

These annual examinations are made at the same time each year (October and November)

and are performed on selected samples of the school children. This annual study sample was selected after careful review of census data and consultation with city planning department officials. On the basis of available information, the 31 school districts of Grand Rapids were classified on a socioeconomic basis. From the 79 schools in these districts, 25 representative schools were selected, and the examiners were assigned schools on a basis of equal-sized samples of comparable population groups. In Muskegon, the annual examinations have been conducted in almost all schools, excluding only a few small schools on the periphery of the city where many students are from rural areas. The examiners work in the same schools each year. Each new examiner is assigned the schools which had previously been assigned to the examiner whom he replaced.

Selected age groups of children are examined within each of the schools. Selection is made on the basis of school grade or class, using all children present in a class or grade of a school. Choosing examinees by grade in this manner will, in some instances, not give well-distributed specific age groupings. For example, an eighth-

grade group will give a well-distributed 13-year-old age group, and will include the older 12-year-olds and younger 14-year-olds when specific age groups are based on age at last birthday. The number of grades included in the 1951 examinations give well-distributed age groupings through the 13-year-old groups.

Each child in a selected grade or class is examined regardless of his residence history. The examiner has no knowledge at the time of examination whether or not the individual examinee is a "continuous resident" of the city in which the examinations are being held.

The following table shows the grades, or selected class groups from these grades, which were included for each annual (fall) examination in Grand Rapids and Muskegon subsequent to the original or basic examinations:

| Year | Grade or class |
|------|------------------------------------|
| 1945 | Kindergarten, 1, 8 |
| 1946 | Kindergarten, 1, 4, 8 |
| 1947 | Kindergarten, 1, 4, 8, 11 |
| 1948 | Kindergarten, 1, 4, 8, 11 |
| 1949 | Kindergarten, 1, 4, 6, 8, 11 |
| 1950 | Kindergarten, 1, 2, 3, 4, 6, 8, 11 |
| 1951 | Kindergarten, 1, 2, 3, 4, 6, 8, 11 |

Table 2. Dental caries experience in deciduous and permanent teeth of continuous resident children of Aurora, Ill., as observed in the 1945-46 examination period

| Age last birthday | Deciduous teeth | | Permanent teeth | | | | |
|---------------------------|-----------------|------------------------|-----------------|----------------------|--------|------------------------|------------------------------------|
| | Number filled | Total def ¹ | Decayed | Missing ² | Filled | Total DMF ³ | Percent of children with DMF teeth |
| Number of teeth per child | | | | | | | |
| 4 | 0. 10 | 2. 07 | 0 | 0 | 0 | 0 | |
| 5 | . 25 | 2. 79 | . 059 | 0 | 0 | . 059 | 2. 7 |
| 6 | . 38 | 3. 36 | . 263 | . 002 | . 015 | . 280 | 15. 2 |
| 7 | . 44 | 3. 51 | . 661 | . 009 | . 035 | . 705 | 33. 9 |
| 8 | . 54 | 3. 60 | . 917 | . 014 | . 111 | 1. 042 | 44. 8 |
| 9 | . 49 | 2. 98 | 1. 185 | . 063 | . 274 | 1. 522 | 55. 2 |
| 10 | . 27 | 2. 28 | 1. 426 | . 089 | . 505 | 2. 020 | 66. 5 |
| 11 | . 15 | 1. 18 | 1. 755 | . 227 | . 688 | 2. 670 | 72. 3 |
| 12 | . 05 | . 43 | 1. 774 | . 219 | . 958 | 2. 951 | 73. 1 |
| 13 | . 01 | . 13 | 1. 658 | . 236 | 1. 195 | 3. 089 | 73. 3 |
| 14 | | | 1. 750 | . 305 | 1. 584 | 3. 639 | 78. 3 |
| 15 | | | 1. 989 | . 501 | 2. 047 | 4. 537 | 83. 1 |
| 16 | | | 1. 941 | . 533 | 2. 712 | 5. 186 | 85. 4 |

¹ Decayed, extraction indicated, or filled deciduous teeth.

² Includes teeth listed as "remaining roots" and teeth destroyed beyond any possible repair.

³ Decayed, missing, or filled permanent teeth. Each tooth is counted only once. A tooth which shows a filled surface is considered a filled tooth regardless of whether or not it has additional carious areas.

Table 3. Dental caries findings, deciduous teeth, in Grand Rapids and Muskegon, Mich., school children, 4-13 years of age, according to year of examination

| Age last birthday | Number of def ¹ deciduous teeth per child | | | | | | | |
|---------------------|--|------------------|-------|-------|-------|-------|-------|-------|
| | Basic examinations 1944-45 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 |
| Grand Rapids, Mich. | | | | | | | | |
| 4 | 4.186 | 5.398 | 3.427 | 3.190 | 3.022 | 2.747 | 2.462 | 2.131 |
| 5 | 5.369 | 6.151 | 5.083 | 3.893 | 4.027 | 3.273 | 2.501 | 2.273 |
| 6 | 6.431 | 6.979 | 5.725 | 5.379 | 4.784 | 4.590 | 3.730 | 2.977 |
| 7 | 6.293 | 7.658 | 6.110 | 5.841 | 5.200 | 4.833 | 4.715 | 4.031 |
| 8 | 5.782 | 8.000 | 5.097 | 5.074 | 4.877 | 4.748 | 4.908 | 4.123 |
| 9 | 4.591 | ----- | 4.446 | 4.110 | 4.428 | 4.410 | 4.229 | 3.856 |
| 10 | 2.837 | ----- | 2.835 | 3.157 | 3.063 | 2.856 | 2.359 | 2.426 |
| 11 | 1.345 | ----- | 2.118 | 2.778 | 1.773 | 1.193 | 1.162 | 1.351 |
| 12 | .473 | .276 | .129 | .105 | .250 | .354 | .245 | .295 |
| 13 | .176 | .130 | .139 | .136 | .170 | .103 | .147 | .117 |
| Muskegon, Mich. | | | | | | | | |
| 4 | 5.050 | (²) | 3.442 | 4.667 | 4.385 | 4.412 | 5.317 | 4.460 |
| 5 | 6.820 | ----- | 5.860 | 5.052 | 5.552 | 5.556 | 5.649 | 5.248 |
| 6 | 7.167 | ----- | 6.239 | 6.179 | 6.056 | 5.992 | 6.019 | 5.667 |
| 7 | 6.663 | ----- | 6.833 | 5.952 | 6.917 | 6.333 | 5.825 | 5.771 |
| 8 | 6.061 | ----- | 4.833 | 3.846 | 4.800 | 6.083 | 5.063 | 5.320 |
| 9 | 4.885 | ----- | 4.315 | 4.344 | 4.714 | 4.482 | 4.088 | 4.173 |
| 10 | 3.084 | ----- | 3.145 | 3.667 | 2.788 | 2.769 | 3.490 | 2.855 |
| 11 | 1.328 | ----- | 1.667 | 2.900 | .643 | 1.212 | 1.085 | 1.460 |
| 12 | .422 | ----- | .143 | .368 | .636 | .679 | .605 | .312 |
| 13 | .234 | ----- | .289 | .174 | .106 | .112 | .127 | .147 |

¹ Decayed, extraction indicated, or filled deciduous teeth. A decayed and filled tooth is counted only as a filled tooth.

² The 1944-45 basic examinations in Muskegon were not done until late spring of 1945; therefore, no repeat examinations were made in the fall of 1945.

In addition to the routine dental examinations in these two cities, special studies, including bacteriological and chemical studies of the saliva, are being made on selected groups of children. The results of these studies will be reported at a later date.

Fluoridation

The addition of sodium fluoride (NaF) to the Grand Rapids water supply started in January 1945. Since that time, the people of this city have been ingesting a water with a fluoride content of 1 ppm F. Daily analyses show that this concentration has been maintained within a 0.2 ppm range (13). No significant mechanical difficulties of any consequence have been encountered. Also, in the course of 7 years of fluoridation, no established complaints of any

ill effects have been encountered from the numerous manufacturing and processing concerns, nor from the population involved.

The water supply at Muskegon remained unchanged until July 1951, when this city started adding fluorides to its water supply.

Results

Base-line data were obtained on the oral health status of 31,007 Grand Rapids residents aged 2-24 years, 8,304 Muskegon residents aged 4-25 years, and 8,811 Aurora, Ill., residents aged 4-20 years. The present report includes only the findings in regard to dental caries in "continuous resident" children aged 4-16 years. This selection excludes the results on children of these ages who have lived outside their respective communities for more than 3 months in

any one calendar year. Table 1 shows the number of continuous resident children of these ages examined each year and their distribution by age.

For purposes of comparison, the results of oral examinations of Aurora school children are shown in table 2. As mentioned previously, the results at Aurora represent the caries experience in children who have used water containing 1.2 ppm F throughout life. It is this same caries experience that one might expect to find in the teeth of Grand Rapids children after fluoridation has been in progress a comparable period of time in respect to the specific age group under comparison.

It should be noted that the dental examiners in this study obtained similar results to those

findings previously reported in the basic epidemiological studies for 12-14-year-old children of Aurora, Ill. (11).

The amount of dental caries experience observed at each examination in the deciduous and permanent teeth in both the study and control areas is shown in tables 3 and 4. There has been a reduction in the amount of dental caries observed in the Grand Rapids children subsequent to fluoridation of their water supply. For example, comparison of the 1951 and 1944-45 findings on permanent teeth shows this reduction to vary from 66.6 percent in the 6-year-old children to 18.1 percent in the 16-year-olds (table 4 and fig. 2). A similar comparison of results at Muskegon shows the percentage reduction to range from 1.5 percent in

Table 4. Dental caries findings, permanent teeth, in Grand Rapids and Muskegon, Mich., school children, 5-16 years of age, according to year of examination

| Age last birthday | Number of DMF ¹ permanent teeth per child | | | | | | | |
|---------------------|--|------------------|--------|--------|--------|--------|--------|--------|
| | Basic examinations 1944-45 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 |
| Grand Rapids, Mich. | | | | | | | | |
| 5 | 0.109 | 0.082 | 0.049 | 0.038 | 0.038 | 0.031 | 0.028 | 0.048 |
| 6 | .775 | .558 | .234 | .367 | .262 | .380 | .261 | .259 |
| 7 | 1.886 | 1.718 | 1.110 | 1.087 | 1.036 | .759 | 1.034 | .844 |
| 8 | 2.945 | 3.267 | 2.542 | 2.615 | 2.304 | 2.155 | 1.766 | 1.577 |
| 9 | 3.898 | ----- | 2.981 | 3.116 | 2.671 | 2.478 | 2.383 | 2.040 |
| 10 | 4.921 | ----- | 3.697 | 3.556 | 3.514 | 3.560 | 3.168 | 2.929 |
| 11 | 6.409 | ----- | 4.235 | 3.556 | 4.318 | 4.686 | 4.362 | 3.669 |
| 12 | 8.073 | 9.529 | 7.624 | 7.026 | 8.317 | 7.015 | 7.100 | 5.886 |
| 13 | 9.734 | 10.759 | 8.920 | 8.469 | 8.338 | 8.111 | 7.206 | 6.600 |
| 14 | 10.945 | 11.901 | 9.410 | 9.500 | 9.414 | 8.895 | 8.546 | 8.211 |
| 15 | 12.482 | 12.675 | 11.264 | 11.938 | 10.609 | 11.797 | 10.121 | 8.906 |
| 16 | 13.499 | 13.000 | 9.333 | 12.472 | 13.502 | 11.833 | 11.350 | 11.061 |
| Muskegon, Mich. | | | | | | | | |
| 5 | .065 | (²) | .044 | .069 | .062 | .135 | .086 | .117 |
| 6 | .811 | ----- | .481 | .657 | .790 | .631 | .748 | .799 |
| 7 | 1.988 | ----- | 1.331 | 1.048 | 2.194 | 1.433 | 2.011 | 1.879 |
| 8 | 2.810 | ----- | 2.833 | 2.154 | 3.500 | 2.583 | 2.958 | 2.629 |
| 9 | 3.808 | ----- | 3.291 | 3.535 | 3.578 | 3.883 | 3.894 | 3.516 |
| 10 | 4.906 | ----- | 4.274 | 3.596 | 4.865 | 4.442 | 4.529 | 4.323 |
| 11 | 6.318 | ----- | 4.250 | 4.700 | 4.714 | 5.932 | 5.667 | 5.338 |
| 12 | 8.655 | ----- | 8.429 | 6.789 | 7.818 | 7.214 | 6.884 | 7.708 |
| 13 | 9.981 | ----- | 9.015 | 9.227 | 10.524 | 9.523 | 9.578 | 9.364 |
| 14 | 11.995 | ----- | 11.091 | 12.000 | 12.266 | 11.076 | 12.111 | 11.356 |
| 15 | 12.862 | ----- | 11.167 | 12.886 | 12.659 | 10.324 | 10.943 | 12.381 |
| 16 | 14.068 | ----- | 19.000 | 12.769 | 14.307 | 12.508 | 13.911 | 13.161 |

¹ Decayed, missing, or filled permanent teeth. A decayed and filled tooth is counted only as a filled tooth.

² The 1944-45 basic examinations in Muskegon were not done until the late spring of 1945; therefore, no repeat examinations were done in the fall of 1945.

6-year-olds to a high of 15.5 percent in the 11-year-olds. In Muskegon, the number of examinations was smaller, especially in the older age group. The 5-year-old group of 1951 is older by an average of 4 to 5 months than the same age group of 1944-45. Preschool children were examined in 1944-45, but in 1951 only children old enough for entrance to kindergarten were examined. It should be noted that the percentage reductions observed at Muskegon do not fit a consistent pattern as do those at Grand Rapids and may, in part, represent sampling error.

In establishing DMF rates, two portions of this rate are derived from observations based almost entirely on objective assessment, namely, the number of missing teeth and the number of filled teeth. Table 5 shows a comparison of the number of missing and filled permanent teeth

for the study and control areas. There has been a reduction in the average number of missing teeth observed in Grand Rapids children up to and including the 13-year-old age group. This situation did not prevail in Muskegon. The findings in regard to the average number of filled teeth in these two areas would not explain the reduction in missing teeth. There has been little change in the average number of filled teeth in Grand Rapids whereas in Muskegon this average shows some indication of having increased slightly in the younger age groups.

Discussion

The 1951 results in this report represent the findings of the seventh year of a study on the effect of fluoridation of public water supplies on dental caries prevalence. The results in

Table 5. Comparison of the number of filled or missing permanent teeth observed in Grand Rapids and Muskegon, Mich., children during the basic (1944-45) examination and the 1951 examination

| Age last birthday | Filled permanent teeth | | | | | | | |
|-------------------|-------------------------|-------|----------------------|-------|------------------|-------|----------------------|-------|
| | Grand Rapids, Mich. | | | | Muskegon, Mich. | | | |
| | Number per child | | Percent of total DMF | | Number per child | | Percent of total DMF | |
| | 1944-45 | 1951 | 1944-45 | 1951 | 1944-45 | 1951 | 1944-45 | 1951 |
| 5 | 0.006 | 0.006 | 5.51 | 12.50 | 0 | 0.011 | 0 | 9.40 |
| 6 | .072 | .068 | 9.29 | 26.26 | .063 | .109 | 7.77 | 13.64 |
| 7 | .338 | .317 | 17.92 | 37.56 | .312 | .404 | 15.69 | 21.50 |
| 8 | .822 | .834 | 27.91 | 52.89 | .719 | .927 | 25.59 | 35.26 |
| 9 | 1.395 | 1.220 | 35.79 | 59.80 | 1.518 | 1.690 | 39.86 | 48.07 |
| 10 | 1.899 | 1.270 | 38.59 | 43.36 | 2.100 | 1.613 | 42.80 | 37.31 |
| 11 | 2.559 | 2.437 | 39.93 | 66.42 | 2.497 | 2.237 | 39.52 | 41.91 |
| 12 | 3.480 | 4.239 | 43.11 | 72.02 | 3.930 | 3.000 | 45.41 | 38.92 |
| 13 | 4.444 | 4.525 | 45.65 | 68.56 | 4.603 | 4.907 | 46.12 | 52.40 |
| 14 | 5.454 | 4.602 | 49.83 | 56.05 | 5.637 | 3.797 | 46.99 | 33.44 |
| 15 | 6.738 | 5.604 | 53.98 | 62.92 | 6.773 | 5.476 | 52.66 | 44.23 |
| 16 | 8.406 | 8.263 | 62.27 | 74.70 | 8.426 | 8.916 | 59.90 | 67.75 |
| | Missing permanent teeth | | | | | | | |
| | | | | | | | | |
| | Number per child | | Percent of total DMF | | Number per child | | Percent of total DMF | |
| | 1944-45 | 1951 | 1944-45 | 1951 | 1944-45 | 1951 | 1944-45 | 1951 |
| 5 | 0.001 | 0 | | | 0 | 0 | | |
| 6 | .001 | 0 | | | .004 | 0 | | |
| 7 | .017 | 0 | | | .017 | .013 | | |
| 8 | .044 | .013 | | | .037 | .044 | | |
| 9 | .150 | .046 | | | .160 | .101 | | |
| 10 | .281 | .163 | | | .241 | .339 | | |
| 11 | .478 | .179 | | | .407 | .468 | | |
| 12 | .645 | .460 | | | .741 | .854 | | |
| 13 | .836 | .366 | | | .937 | .929 | | |
| 14 | 1.045 | 1.195 | | | 1.149 | 1.085 | | |
| 15 | 1.239 | .849 | | | 1.240 | 1.857 | | |
| 16 | 1.501 | 1.197 | | | 1.500 | 1.574 | | |

Grand Rapids for 1951 represent findings after 6½ years of exposure to a fluoride water environment. The tabular data indicate a definite reduction in age specific caries rates in Grand Rapids children. As shown in figures 1 and 2 the observed caries rates for Grand Rapids have changed over the past 6 to 7 years and in the younger age groups are approaching the findings on continuous resident children of Aurora, Ill., in 1945-46.

It is of special interest to note the increment in dental caries between ages 6 and 9 years. In Grand Rapids for this age period in the basic examinations, this increment was 3.123 DMF teeth per child as compared to 1.781 DMF teeth per child in the 1951 examinations. For Muskegon children, the basic examination results indicate an incremental increase between the years of 6 to 9 of 2.997 DMF teeth as compared to 2.717 as observed in 1951. Thus, the increment of dental caries over this 3-year-age period has decreased in Grand Rapids by 1.34 DMF teeth while at Muskegon the decrease is only 0.28 DMF teeth.

Attention is called to the fact that DMF rates in this age group (6-9 years) reflect mainly the caries rates in first permanent molars. In other words, the results to date on Grand Rapids children indicate that their first permanent molar teeth are decaying at a rate which is only 57 percent of the 1944-45, or prefluoridation,

Figure 1. Comparison of dental caries experience in deciduous teeth of continuous resident school children in Grand Rapids, Mich., and Aurora, Ill.

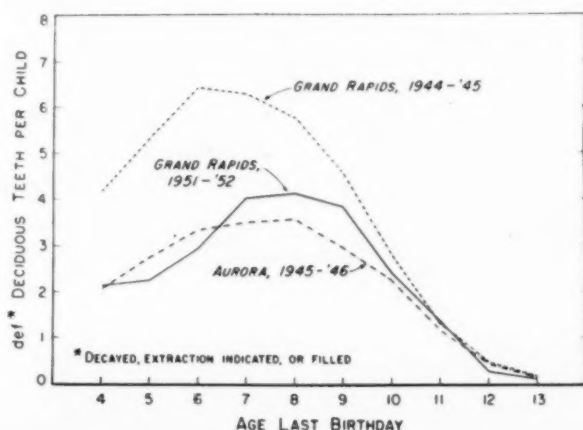
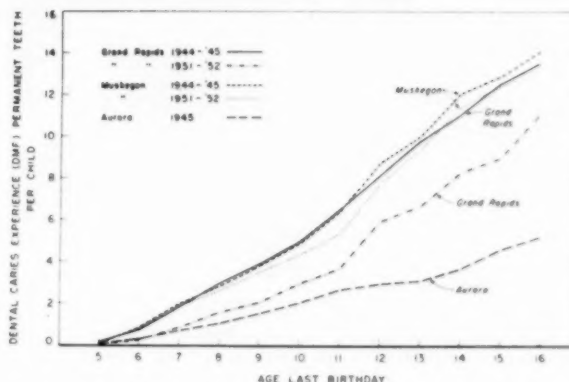


Figure 2. Comparison of dental caries experience in permanent teeth of continuous resident school children in Grand Rapids and Muskegon, Mich., and Aurora, Ill.



rate. Also, considering that only the 6-year-old and part of the 7-year-old children were born into a fluoride environment, this result is consistent with the findings for Aurora children.

It should be noted that the only known major change affecting the environment of these two groups of children over the period of study has been the fluoridation of the Grand Rapids water supply. There have been no concerted efforts to inaugurate any special caries control programs, such as topical fluoride programs, in either city since the study started. From an epidemiological standpoint the results of this study, together with those of other comparable studies, permit the conclusion that adjusting the fluoride content of public water supplies will result in a reduction of the incidence of dental caries in school children.

Summary

The methodology and results after 7 years of the Grand Rapids-Muskegon study have been described. The 1951 results on continuous resident children after 6½ years of fluoridation of the Grand Rapids water supply indicate:

1. There has been a reduction in dental caries rates in permanent teeth of Grand Rapids children ranging from 66.6 percent in 6-year-old children to 18.1 percent in the 16-year age group. Similar results have been obtained regarding the deciduous teeth.
2. Similar reductions have not been observed in Muskegon where the water supply remained

"fluoride-free" (<0.2 ppm F) until the last 3 months of this study period.

3. This change in dental caries rates at Grand Rapids was also reflected in observations based on objective assessment, that is, a reduction in the number of missing teeth.

4. A comparison of the 1951 caries rates in Grand Rapids with those of Aurora, Ill., shows that insofar as can be determined to date the use of a fluoridated water gives the same beneficial effects as does the use of a natural fluoride water of similar concentration.

ACKNOWLEDGMENT

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The authors also acknowledge the assistance given by the superintendents of education, principals, and teachers of their respective cities. And they acknowledge the cooperation of the health officials in the cities involved in this study.

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"We are in danger of building a Tower of Babel"

By VANNEVAR BUSH, D.Eng., Sc.D.

An eminent scientist speaks of overspecialization and the volume of publication . . . and proposes concrete action

EVERY SCIENTIST feels acutely today the effects of overspecialization. The volume of publication is so vast that it is impossible to keep abreast of it, even as the field of interest is narrowed. Whole new sciences and branches of engineering appear, with their specialized societies and journals. Intensely progressive gatherings of research workers develop their own jargon, unintelligible except to the initiated, heightening the barriers which separate their works from the main stream of progress.

Dr. Bush is president of the Carnegie Institution of Washington. As wartime director of the Office of Scientific Research and Development he was intimately associated with developments in nuclear fission and with the work of the Committee on Medical Research. Dr. Bush's address to the 23d annual Scientific Assembly of the Medical Society of the District of Columbia appeared in full in the January 1953 issue of the Medical Annals published by the Society. These excerpts are presented with permission of the editors and the author.

We are told that, long ago, there was a strange sort of real estate development. My memory of what I learned about it in my youth is somewhat hazy. But it seems that there was a project to construct some sort of Empire State Building, only much larger and more grandiose, reaching up toward the sky and mingling with the clouds. It was called the Tower of Babel. As the story goes, it was never completed, for the plans ended in confusion. The workmen suddenly found that each one was speaking a special language and that no man understood what the other was saying. So the minor construction went on piece by piece, but none of the pieces fitted; and the general plan of construction was completely lost. We are in danger, in science, of building a Tower of Babel.

The Complexity of Man

This is especially true in the science that deals with man. For man is complex, with a complexity far exceeding that which was assumed in the early days when the practice of medicine was a simple matter of applying empirical experience

and the science of medicine was nonexistent. As we have learned more, so have we learned that there is vastly more to learn before any comprehensive over-all understanding can emerge. A unitary organism has been found to involve the widest possible range of science, in the interconnected phenomena by which it functions to maintain existence in its environment.

Very subtle organic chemistry appears in connection with its hormonal system, its enzymes and vitamins, its antibodies, the nucleic acids of its genetic apparatus, and the metabolism of its proteins. A mysterious process by which a substance molds its surrounding medium into its own image transcends all that classic chemistry has to teach. In the chemistry of muscle, that process, unused by man in his artificial engines, whereby the energy of chemical combination is transformed directly into mechanical work without the intervention of any other forms, leads us into thermodynamic and chemical considerations beyond our present comprehension. The electrochemistry of nerve action introduces relationships far more bizarre than those simple effects which man utilizes in his batteries or his electrometallurgy.

And all this is affected, in completely ungrasped ways, by the functioning of a brain, which in its mere complexity reaches far beyond the relatively feeble electronic computing devices of which man is currently so proud, and which undoubtedly also involves phenomena the mere nature of which we cannot now specify or define, much less examine. The human system is unbelievably complex, and its examination by research calls for all the science that man has yet learned and for much which is still a closed book.

All this gives zest to our endeavor. It makes the study of man by man the most challenging problem that man can conceive. There will be many researches, many papers, many lives lived, before there can emerge that integrated, complete understanding which alone can form a sound and adequate scientific base for the profession of medicine. And in the meantime we pursue individual paths, which continually diverge, which become daily more specialized; and there is danger that the pioneers on the boundary of knowledge will completely lose touch with one another, that we shall learn

more and more about less and less, and that the grand design may be completely obscured by the inconsequential detail which we pile up before it.

I can give you no solution for the quandary in which we find ourselves. There is probably no single solution. But there are a number of things which would help.

Versatility and Understanding

For one thing, I feel that it is obvious that the present day calls for more versatility and breadth of understanding. The difficulty is to acquire these virtues without at the same time becoming superficial. I feel that in our education, not merely in the field of medicine but in all the professions, we need more emphasis on the ability to grasp, on learning to learn, with the sacrifice of a great deal of practical, detailed, factual knowledge; more dependence on ability to find and evaluate, and less on memory. For the facts presented to memory are today overwhelming in any profession, and the attempt to carry them all, even for a narrow field of practice, can lead only to mental indigestion and a stultifying of those qualities which distinguish a human brain from a book or an adding machine.

This leads to the thought that we need to give attention to the means by which our accumulated knowledge becomes stored and transmitted. The printed page, the library, the spoken word, the lecture—in the forms in which they have operated for centuries—are no longer adequate for the purpose. And we seem to be doing little to improve the means for gaining access to our accumulated knowledge, which is growing at a prodigious rate. The holdings of prominent university libraries have been doubling every 16 years for some time. The number of journals publishing results of original research runs into many thousands. The pace is now increased and especially marked in science. How many of you, for example, have time to keep up with the literature written in the various fields of medicine?

It is strange that we seem to be so baffled by this problem in these days of intense mechanization. Machinery, control devices, and instruments, have entered many a field to make it pos-

sible to contend with growing intricacy of operation. A modern bank, a modern factory or refinery could not operate without this mechanization. Sorting machines, automatic controls, applied power, and machines which make machines have enabled us to build our civilization to its present point of high individual productivity, interrelationship, and standard of living. But these things have hardly touched as yet the ways in which we store and communicate our findings and our thoughts.

New Methods of Publishing

Books and journals published for a limited group such as yours are bound to be expensive; they cannot be produced by conventional means at prices that are easy to bear. This fact tends to reduce further the size of the group that can have easy access to them, however essential to your profession may be the information they contain. True, there are devices being built which will greatly decrease the cost of printing on paper. The day of metal type, which has served so long, may be nearing an end. New electronic photocomposition machines are beginning to produce books, and this is by no means the final step in a revolution of methods of printing.

We also have microfilm. With some of the refined types of film developed during the war it is no exaggeration to state that the *Encyclopaedia Britannica* could be compressed to the size of a matchbox. There are all sorts of useful but not revolutionary card sorting processes and the cards can carry microfilm. There is a little used machine in existence—the rapid selector—which can review items on a strip of microfilm at the rate of 1,000 items a second and print those which are selected in accordance with a code set on a keyboard. It could, for example, review the case histories of half a million hospital patients in 10 minutes and present for aid in diagnosis printed copies of the few cases which corresponded to an unusual set of symptoms and complications. I say it could, but as yet it does not.

We might profitably give some attention to our methods of indexing and cataloging scientific literature. In an era of chemical physicists, physical chemists, biophysicists,

biochemists, neurologists, neuropathologists, neurosurgeons, clinical psychiatrists, and so on, it is difficult to know how our knowledge ought to be classified and how to thread our way through the classifications, once they are temporarily established, to find the information that we need.

The rapid selector mentioned above will select according to an established code, but the code must be developed on a rational principle so that it can be effectively operated. No system of coding or of indexing under established subject heads can efficiently serve to guide us through the written thoughts or findings of scientists when the very science in which they work will not submit to definition. We can only wish—the optimists among us may hope—that a way will be found for converting into some form of mechanism the kind of fluid indexing and cataloging that takes place in our minds. There is here a feature which man has not yet introduced into his machinery, a feature of great power, the pursuit of paths through a complex record by means of association of ideas. Modern electronics can do for us almost anything we ask in the way of rapid, involved operations upon masses of data. But we still tell our research findings to one another in much the same old way, and we record our research results in a mass of paper from which their extraction becomes increasingly laborious.

Two Lines of Practical Action

There are two very concrete things that we can do in the present situation that can help enormously.

In the first place, we can be intelligible. We can school ourselves—all of us—to express ourselves so that what we have to communicate can be quickly and easily apprehended by others within our profession and in the nearly related professions. There is, as has recently been said, a moral obligation upon all of us to be intelligible.

In the second place, we can gather, integrate, interpret. We can take measures to encourage a few at least within our professions who have the native skill to gather, summarize, and interpret the information developed by many workers—who can make great masses of seem-

ingly confused data clear, intelligible, and useful to their fellows. Men possessing this kind of skill are rare and need to be encouraged. In these hurried days their efforts in explaining where we are, where we are going, and what recent developments really mean, is utterly invaluable.

I said before that the most helpful thing that can be done to advance fundamental science is to find the truly gifted scientist and support him to the utmost. Let me repeat this for the individual who can integrate the current stream of emerging knowledge. Only too often his work does not receive the recognition it deserves, and his labors are performed at the sacrifice, not only of his own career in strictly novel research, but also of his scale of living, for the direct rewards of this sort of publication are not large. I wish there were more generous support for labor of this sort and more recognition for this type of attainment. Had I invented a new dynamite and reaped a fortune from it, I should be inclined to establish a Nobel Prize for the integrator and interpreter of science, who can in these days often serve his fellows far more

than the individual who merely adds one morsel to the growing, and often indigestible, pile of accumulated factual knowledge.

The dangers and difficulties which attend us as the pace of scientific research is quickened and the field of knowledge expands into many new paths . . . are real, and we would do well to devote deep thought to their avoidance and to finding solutions for the problems they present. Still, the most significant aspect of the present day in science is that we are going ahead energetically and accomplishing much. . . . It is far better that we should be embarrassed by the consequences of our rapid progress than that we should be bogged down to a snail's pace. Our problems of integration and interchange are solvable if we will devote enough of our energy to grappling with them. . . .

These are invigorating days in science and its applications. And if we can only avoid the disaster of another world war, I am convinced that we are on the threshold of great things, full of hope for a better future and a more healthy, happy race of men.

Five Reports on Psychosocial Aspects of Cancer

During the National Conference of Social Work sessions at Chicago in May 1952, the American Cancer Society sponsored discussions of the psychosomatic and psychosocial aspects of cancer under the general title, "Living With Cancer." *Public Health Reports* is publishing in this issue the fifth and final paper selected from these discussions—"The Aggregate Community Picture," by Edna Nicholson (see facing page 169). The four previously published papers are:

Professional attitudes and terminal care, by Charles S. Cameron, October 1952, pp. 955-959.

Typical patient and family attitudes, by Addie Thomas, October 1952, pp. 960-962.

Psychological impact of cancer surgery, by Arthur Sutherland, November 1952, pp. 1139-1143.

The sequence of emotional reactions in radical mastectomy patients, by Morton Bard, November 1952, pp. 1144-1148.

The Aggregate Community Picture

By EDNA NICHOLSON, M.S.P.H.

ATTITUDES are the source of action whether they are those of the individual or of a community of individuals. Community attitudes toward cancer are vastly important because of the ways in which they affect human suffering and what is done to relieve it.

Community-wide participation is essential if the necessary services and facilities are to be available. Effective provision of these services and facilities involves significant numbers of highly trained personnel, necessitates the spending of large sums of money, and requires good community planning and coordination.

Unless effective community provisions have been made, little can be accomplished either on a mass basis or in obtaining good diagnostic and treatment services for an individual patient. Provisions must include:

Research. Research does not consist of some form of magic. It does consist of endless hours of painstaking effort by highly trained personnel, working with specialized and often very expensive equipment in places where the necessary material is available, the facilities are adequate for their needs, and the funds are sufficient to meet the cost.

Education of professional personnel. Well-staffed, well-organized, and well-financed educational and training centers are essential if there are to be good doctors, nurses, social workers, health educators, laboratory and X-

ray technicians, and other essential personnel available when needed.

Education of the public. Not enough is known about cancer to cure all cases even though discovered early. But the number of persons dying for this reason is perhaps far less than the number who are suffering and dying because they did not seek care early, or did not present themselves to reliable physicians, or did not follow the advice they received at a point where it might have controlled the condition and saved their lives. Procrastination and quackery are making ready victims of cancer patients. Broad and effective community programs are needed to educate the public.

Hospitals and related facilities and equipment. Facilities are needed for diagnosis, for surgical care and other types of treatment, and for good care of patients, including terminal care. The size, complexity, and cost of these facilities and equipment are such that there is little or no possibility of providing them without broad community participation.

Coordination of services. To achieve the best possible care for patients and the most efficient use of community money, there must be provisions for coordinating the many specialized services which may be required for the individual patient and adequate machinery to achieve effective coordination in community planning and action. This need was sharply delineated in a recent study of terminal care for cancer patients. Intensive study of more than 5,000 cases in an urban area showed that, in general, almost enough facilities and services were available in the community to provide the necessary care, but that many patients were not receiving the care they needed because they did not know it was available, or because the patients needing

Miss Nicholson, director of the Central Service for the Chronically Ill of the Institute of Medicine, Chicago, presented this paper as a part of the American Cancer Society's program at the National Conference of Social Work held in Chicago, May 27, 1952.

the care and the resources available to provide it were not getting together. Deficiencies in community resources need to be clarified, unnecessary gaps and duplications eliminated, development of new facilities and services guided, and existing sources operated and used with effectiveness for the patients and economy in expenditure of community money.

Meeting the costs of medical care. Provisions must be adequate for persons unable to pay. At present we have far too many different public assistance programs responsible for financial help to needy people, with too much personnel and money being wasted in maintaining artificial distinctions between specialized, categorical programs. And almost all of them are operating on seriously inadequate standards in staff and services and in the assistance they are providing to needy cancer patients along with other dependent people.

Obviously, there are many factors which influence the adequacy with which any community provides the services necessary in the control of cancer and in the diagnosis, treatment, and care of persons suffering from cancer. Highly important among these factors are the attitudes with which the community regards cancer and its responsibility for meeting the problems related to it. There is nothing mysterious about community attitudes. They represent merely the aggregate of the attitudes of the individuals who make up the community. If most of the people in the community regard cancer with such fear or guilt that they cannot accept the problems calmly and plan wisely to meet them, these attitudes almost certainly will be reflected in poor community planning, disorganization, and inadequate services. If a majority of the individuals in the community are selfish and indifferent to the problems of people who are sick and in trouble, their attitudes will be evident in lack of effective community support and an inability to develop and maintain good services. Conversely, when a majority of the individuals in the community feel a sense of responsibility for their fellow men; when they are realistic and objective in facing facts; when they are moved by humane understanding and intelligent compassion, their community will have good services and the fullest advantage will be taken of all existing possibilities for the prevention

and control of cancer and for the diagnosis, treatment, and care of persons affected by it.

Fear of Cancer

One of the most prevalent and potentially damaging attitudes toward cancer is fear. The fear of an individual that cancer may strike him or that it may take away someone he loves is so widespread as to be almost universal. It may be a normal and perfectly intelligent reaction to reality. It is one of the strong factors which helps to motivate intelligent people to consult a physician and to follow his advice. It causes communities to provide the money and to take the action necessary to assure that good services and facilities are available for the management of cancer.

However, uncontrolled fear of cancer is likely to defeat the very purposes it should serve. Uncontrolled fear may be evidenced by refusal to face the facts and by consistent efforts to avoid all contacts with realities which must be faced if anything constructive is to be done about cancer. This results almost inevitably in a lack of sufficient services, inadequate support for good services, and poor planning—or no planning at all—in the development of new facilities and services.

Often fear of cancer results in such panic that there are intense demands for community action, but the demands are accompanied by such strong emotions as to make sound, realistic planning impossible. New facilities then may be developed blindly only to discover too late that they are not of the type suitable to meet the real need. Uncontrolled fear may be expressed in the form of a paralyzing hopelessness which makes it difficult or impossible to develop and maintain good community services.

Association of Guilt

Feelings of personal guilt are widely prevalent in the care of cancer patients. Usually, they arise from situations in which relatives become deeply disturbed by some failure, or imagined failure, in their past relationships with the patient. As they face the more or less imminent possibility of the patient's death they may be almost overwhelmed by their feelings

and may begin to reach out frantically for ways in which they can compensate for their failures and reassure themselves regarding their devotion to the patient and their general worth as human beings. These feelings probably are much more widespread than is generally recognized. Like fear, guilt may be so common as to be part of a normal reaction.

Some release for the feelings is essential. In many instances, of course, the individual is able to adjust to the situation with reasonable success. In others, however, he may be so driven by his feelings that he becomes excessively protective of the patient, oversentimental about all cancer patients, critical of the doctors, nurses, hospitals, and others in the community, and a source of disturbance in efforts to meet community problems. He may find others who share his emotional distress and his feelings of rebellion. Another "crusading" group in the community may be the result, guided by emotion rather than facts and acting on impulse without sound guidance—and sometimes in rebellion against sound guidance. Groups of this kind tend to spring up everywhere. Usually, they do not reach sufficient size nor have sufficient stability to achieve substantial results of any kind. They may endanger good community services, however, by diverting badly needed interest and support from those which have value to those which do not.

Bane of Self-Interest

It is an entirely normal reaction for each individual to consider, first, his own comfort and security. It is not surprising, therefore, that self-interest is found in community services for the management of cancer just as it occurs elsewhere in human life. There are varying degrees, however, in the attitudes of individuals and communities toward their fellow men. In some the prevailing attitude seems to be one of indifference—or even of censure—for people in trouble. Where little, if any, feeling of community responsibility for people who are hopelessly sick and dependent exists, it is difficult or impossible to develop and maintain good community services.

In other places, the situation seems to be only slightly better. These communities may not

be able to ignore their responsibilities completely. They may enact laws making legal provisions for the care of sick or helpless people, but, because they are not willing to make real sacrifices of their own comfort and security, they may give so little financial and other support to the programs that the laws have little effect.

In some communities, various civic and professional groups may deplore the absence of good community services but be unwilling to submerge their own vested interests sufficiently to achieve effective, well-rounded community action. Social workers criticize physicians for not supporting a plan which the social agencies develop. Hospitals and doctors criticize the social agencies. Businessmen and labor leaders are critical of all of them. And while each is blaming someone else because the community does not have the facilities it needs, no one is submerging his own particular interests and point of view long enough to make an honest effort to understand the problems of the others; and the people who desperately need care continue to be left without it.

There is another aspect of self-interest which also may endanger good community services for cancer patients. Often it is a subconscious type of self-interest buried under an apparently sincere and zealous devotion to the development of good health and welfare services in the community. There are persons and organizations who sponsor a "cause" in an effort to gain social prestige. There are others who are hungry for personal glory and power and are willing to work hard for good community services only so long as they can dominate them and receive widespread credit and publicity for their good deeds. These people and groups in the community often are motivated by self-interest of this kind without fully recognizing it. They may believe themselves to be concerned sincerely for the welfare of the people they supposedly are serving.

Constructive Attitudes Toward Cancer

Fortunately, in every community there are attitudes which have constructive effects upon the development and maintenance of good community services. In all communities these

attitudes are present to some extent. Even in those places where they seem to be overshadowed by less wholesome attitudes, it is probable that they can be found in some degree and, with care, can be increased to a point where eventually they predominate in controlling community action.

In any effective effort to assure good facilities and services to meet the problems presented by cancer, it is important that such attitudes characterize the planning and action of the community.

A sincere sense of responsibility for helping people who are sick and in trouble implies more than a sentimental desire to relieve suffering. It includes a broad responsibility for assuring that real, practical help of good quality and adequate amount actually is provided and kept consistently available.

A realistic acceptance of the importance of factual information with careful analysis of problems, sound planning, and consistent long-range effort is essential. The problems which now stand in the way of good community facilities and services for cancer patients have been growing for many years. They are deeply rooted and are intertwined with many other health and welfare problems in the community. If they are to be solved, there must be accurate information about what the problems really are; how much is being done to meet them; what specific factors are operating to cause the existing deficiencies; how these factors can be overcome; specifically what new facilities and services are needed and how many; where they should be located; how they should be operated; what their relationship should be to other essential community services; and how these facilities and services can be financed. These patients have waited too long, and their needs are too desperate, for us to fail them now by not accepting the need for clear thinking and long, hard work.

There are many individuals and many communities who would like to have better facilities and services available for cancer patients. Too often, however, their desire for these services is spasmodic and does not go deep enough to accept and meet the necessity for assembling and analyzing factual information to clarify the needs, for formulating effective plans for

meeting them, and for working consistently over long periods of time to assure that the needs are met. Instead, they tend to seize upon whatever idea presents itself on the spur of the moment and to base their actions upon superficial thinking and too few facts.

It is under circumstances such as these that communities fail to distinguish clearly between a need for more beds for cancer patients and a need for more adequate funds to pay for care of patients in beds which are available. This type of approach may lead to the development of specialized hospitals and related institutional facilities exclusively for the care of cancer patients, when closer integration of cancer facilities with general hospitals and medical centers might provide better services and entail less cost to the community. The same approach may be responsible for the "pesthouse" type of planning which establishes separate institutions exclusively for terminal care of cancer patients. All of these things may be done with the best possible intentions. Certainly, good intentions are greatly needed. They must be supplemented, however, with a realistic understanding of the need for facts and clear thinking.

Understanding and acceptance of the emotional aspects of human behavior and the emotional requirements of the individual is another community goal. We have tried too often to choose between intelligence and emotion on the assumption that these two qualities necessarily are antagonistic. Yet, the human being is an indivisible combination of both qualities, and there is no way in which human needs can be met adequately without consideration for both.

For humane reasons, the emotional effects of various types of facilities and services must be fully considered. Because of the strong influence of emotions on human behavior and on the ways in which community services are used by people in need of care, it is essential also for very practical reasons. It is unrealistic to attempt to plan community services without consideration of the probable emotional reactions of the patients, their families, and the community to the various types of services under consideration. Similarly, intelligence must be used if there is to be any hope that the services will be stable, well-operated, and effective.

Statistics in a Health Department

Medical Care Plan

By MATTHEW TABACK, A.M., and HUNTINGTON WILLIAMS, M.D.

THE FUNCTION of statistics in the sense of analysis of collected data and the methodology for data collection will be discussed in this paper in relation to three phases of medical care administration: (a) formulation of the initial medical care plan and its close guidance during early operation and subsequent development; (b) determination of patterns of utilization of services, including statistics on failure to use, as well as injudicious use of medical care benefits; and (c) determination of quality of medical care. Medical care statistics as indexes for planning and administration have been stressed elsewhere (1).

Health Departments and Medical Care

Due to the success of health departments and medical research in communicable disease control and as a result of the recent marked declines in infant and tuberculosis mortality, prevention and control of disease among the indigent through provision of early and comprehensive medical care has become increasingly a responsibility of the local health department. Consistent with this trend, the Association of State and Territorial Health Officers in 1950 officially requested that administration of public medical care programs be placed under the official health

agency (2). Thus by 1950, Terris and Kramer (3) report, "62 or 5 percent of all full-time health departments have responsibilities for administering general medical services of varied scope and character."

The medical services most commonly provided are those of the physician in the home, clinic, or office and the provision of drugs and laboratory services. The geographic coverage of these health department administered programs varies from Maryland's state-wide plan for relief clients and medically indigent persons to programs covering small counties and cities of approximately 25,000 population.

The medical care programs in Maryland represent the result of intensive investigations by the Committee on Medical Care of the State Planning Commission during the period 1940-46. Following separate studies of the medical needs and resources of the counties of Maryland and of Baltimore City, two distinct and administratively independent programs were established. Both county and city programs are concerned with indigent persons and are founded upon the concept of family coverage for specified periods of time.

Baltimore City Program

The persons covered by the Baltimore City medical care program initiated in 1948 are referred by the welfare department to the health department. Assignment for medical services, regardless of any stated need, is made by the health department to an appropriate medical care clinic. Cooperating with each of the six medical care clinics is a panel of physicians, one

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of whom is selected by a representative of the family. The family has free choice of physician and the physician retains the right to refuse to accept as patients any family. The manner in which services are rendered is shown in table 1.

Two points should be emphasized. The population covered is always known both in numbers and in detailed characteristics. The health department is primarily responsible for integrating the program; it has very little responsibility for providing services directly.

In view of the initial size of the program (population to be covered estimated at 21,000), it was decided to establish in the medical care section a statistical unit responsible for advising the medical care program. This unit receives technical assistance from the bureau of biostatistics and concerns itself with the accumulation of data required for evaluation and program analysis as well as with maintenance of the records system for disbursement of funds.

Benefits to patients and cost per service are two basic concepts fundamental to any assessment of a medical care plan. The success of such a plan can be measured by the extent to which it meets the essential medical needs of the population to be covered and by the amount and quality of services rendered per specified unit of money expended. Several procedures which

assist in the guidance of a program providing maximum patient benefit at minimum cost are described.

Indexes for Planning

A medical care program must be tailored to fit the population to be covered. In figure 1, the population of the United States, by age, is contrasted with the group covered by the Baltimore City medical care program and the enrolled members of the Health Insurance Plan of Greater New York (4). The indigent population of Baltimore has an extremely high proportion of persons at each end of the age scale, with a resultant low level in the middle-age categories. Compared with the general population, Baltimore has few persons in the young and middle-adult period. Note the opposite pattern in the age profile for the Health Insurance Plan, in which the adult ages predominate and persons in the older ages are few in contrast to the general population.

An examination of the age characteristics of the group covered by the Baltimore City medical care plan shows that the needs of a public assistance group are particularly associated with the problems of the aged, and in addition should provide an extensive preventive and pediatric service for the large numbers of children found in this group.

Analysis of the race and sex characteristics of the public assistance population (table 2) reveals a markedly different distribution than that of the community. Table 3 shows a definite excess of Negroes in the medical care group at most age levels, and significant concentration of females for the adult ages, suggesting a pattern of medical need associated with conditions commonly found among Negroes and among women.

A knowledge of the environmental and socioeconomic circumstances of the population to be covered by a medical care program furnishes useful information on the capabilities of the beneficiaries to assume responsibility for the care of ill members in the home or to benefit from health education efforts.

Figure 2 indicates the geographic characteristics of the covered population. White persons appear to be widely distributed throughout the city, with a small number of concentrated

Table 1. Agencies providing medical services and method of payment, Baltimore City medical care program

| Agency | Services provided | Method of payment |
|---|---|---|
| Private physician. | General care in the office or home; day and night. | Capitation: \$7 per person referred per year. |
| Medical care clinic. | General examination, diagnostic and special therapeutic services. | Capitation: \$10 per person referred per year. |
| Neighborhood druggist, hospital pharmacy. | Preparation of prescriptions as written by participating physicians. | Fee for service: based on wholesale cost of ingredients plus service fee. |
| Health department. | Clinical services: well-baby, prenatal, tuberculosis, venereal disease. | Free. |

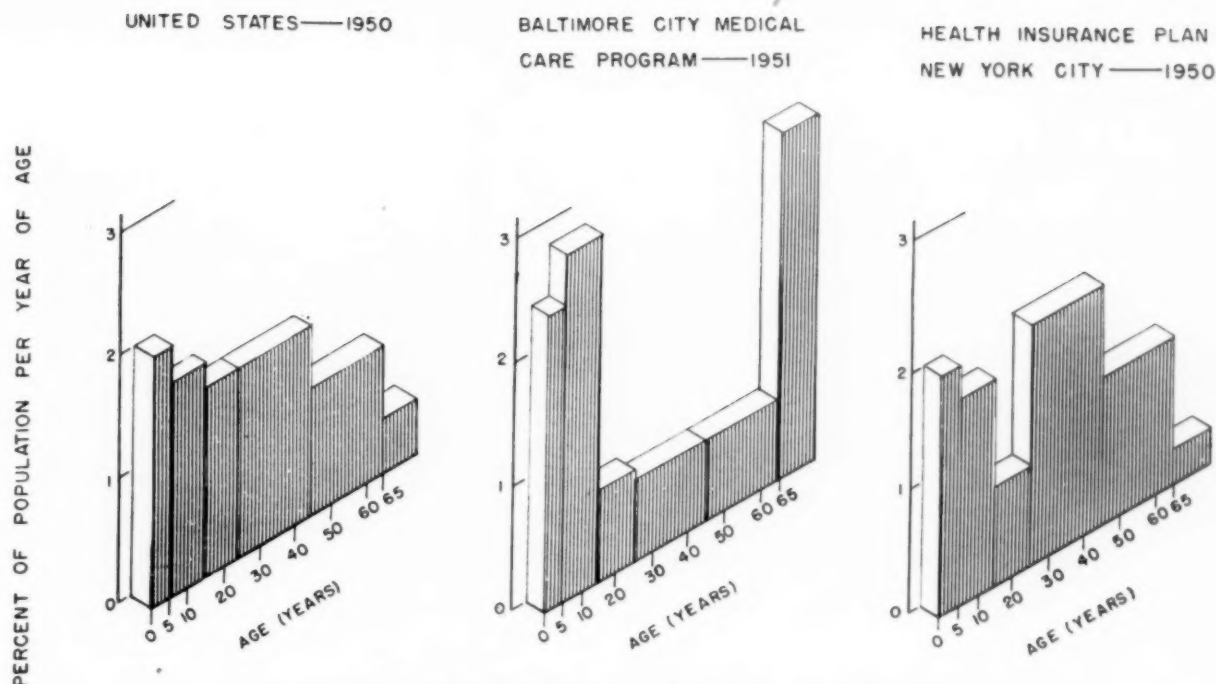


Figure 1. Distribution of selected populations, by age.

foci; the nonwhite medical care group is densely concentrated in the hub of the city.

Detailed housing statistics by census tract reveal the slum conditions in which the Negro group resides. Data on density of households indicate extreme crowding. With a few exceptions, the environmental circumstances of a considerable proportion of white covered families are more favorable than those of the Negro family units.

The limitation which the medical staff must expect in capabilities of patients for modification of the location or nutrition of the family is clearly demonstrated by the family budget. In 1950, according to an estimate of the Bureau of Labor Statistics (5), an elderly couple required an annual income of \$1,779 to maintain a modest standard of living. For elderly couples in the medical care program, who are dependent on welfare department grants, the current average income per couple from all sources is \$1,134, considerably less than that considered sufficient.

Estimation of Medical Needs

In developing the detailed organizational framework for administration of a service program, some estimate is necessary of the utiliza-

tion expected within a given pattern of providing care. Especially is this true for programs predicated largely on a capitation principle. Underestimates of utilization may cause hardship and dissatisfaction among the participating physicians. Excessive overestimate will result in a distribution of public funds which cannot be defended in budget reviews.

Several lines of attack on this problem were available at the initiation of the Baltimore City medical care program. The experience since 1948 both in health department programs and in such units as the Health Insurance Plan of Greater New York provides more recent information for planning purposes.

In considering an indigent urban population, it is well to recall that a principal source of medical service is the hospital out-patient department. A check of services to indigents during a prescribed period of time, when related to the known population of such persons, provides an estimate of utilization of clinical services as well as of their distribution by type.

Although 20 years old, the findings of the Committee on the Costs of Medical Care have great potential value as first approximations of expected volume of medical services in a com-

Table 2. Percentage distribution of population by race and sex, total Baltimore City and persons covered by Baltimore City medical care program

| Population | Total | White | | | Nonwhite | | |
|---|-------|-------|------|--------|----------|------|--------|
| | | Total | Male | Female | Total | Male | Female |
| Baltimore City (1950)..... | 100 | 76.2 | 34.3 | 41.9 | 23.8 | 10.7 | 13.1 |
| Baltimore City medical care program (1951)..... | 100 | 26.3 | 10.4 | 15.9 | 73.7 | 29.0 | 44.7 |

prehensive program. In one of the committee's investigations, Falk, Klem, and Sinai (6) present information on services received during a 12-month period, according to family income. Utilization of the higher-income groups in this study represents a reasonable basis for expected utilization in a health department sponsored program. Baltimore has been fortunate in serving as an area for a 5-year study of causes of illness and utilization of medical services conducted during the period 1938-42 (7, 8). This type of investigation provides data of inestimable value and accuracy. Care must be taken in applying such material to populations with unusual distributions in respect to age and race; but with appropriate correction, observations made from such surveys furnish another

source of information upon which an estimate of utilization may be based.

Survey of Medical Resources

In formulating the initial medical care plan, it is necessary to determine whether the medical facilities are sufficient in number and properly disposed to meet the objectives of the program.

The blueprint for the Baltimore City medical care program places in the hands of the general practitioner the means to provide basic medical care for all covered families. One of the first tasks, therefore, was to determine the distribution of physicians in general practice with respect to location and number.

Analysis of the physician-per-population ratio in the white component of the community

Table 3. Persons covered, according to age, race, and sex, Baltimore City medical care program, July 1951

| Age group | Total | | | White | | | Nonwhite | | |
|------------------|--------|-------|--------|-------|-------|--------|----------|-------|--------|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| Number | | | | | | | | | |
| All ages..... | 22,744 | 8,967 | 13,777 | 5,974 | 2,370 | 3,604 | 16,770 | 6,597 | 10,173 |
| 0-4..... | 2,692 | 1,396 | 1,296 | 411 | 213 | 198 | 2,281 | 1,183 | 1,098 |
| 5-14..... | 6,334 | 3,185 | 3,149 | 1,147 | 562 | 585 | 5,187 | 2,623 | 2,564 |
| 15-24..... | 1,841 | 606 | 1,235 | 263 | 100 | 163 | 1,578 | 506 | 1,072 |
| 25-44..... | 3,241 | 486 | 2,755 | 665 | 160 | 505 | 2,576 | 326 | 2,250 |
| 45-64..... | 3,184 | 1,249 | 1,935 | 905 | 411 | 494 | 2,279 | 838 | 1,441 |
| 65 and over..... | 5,452 | 2,045 | 3,407 | 2,583 | 924 | 1,659 | 2,869 | 1,121 | 1,748 |
| Percent | | | | | | | | | |
| All ages..... | 100.0 | 39.4 | 60.6 | 100.0 | 39.7 | 60.3 | 100.0 | 39.3 | 60.7 |
| 0-4..... | 11.8 | 6.1 | 5.7 | 6.9 | 3.6 | 3.3 | 13.6 | 7.0 | 6.6 |
| 5-14..... | 27.9 | 14.0 | 13.9 | 19.2 | 9.4 | 9.8 | 30.9 | 15.6 | 15.3 |
| 15-24..... | 8.1 | 2.7 | 5.4 | 4.4 | 1.7 | 2.7 | 9.4 | 3.0 | 6.4 |
| 25-44..... | 14.2 | 2.1 | 12.1 | 11.1 | 2.7 | 8.4 | 15.4 | 2.0 | 13.0 |
| 45-64..... | 14.0 | 5.5 | 8.5 | 15.2 | 6.9 | 8.3 | 13.6 | 5.0 | 8.6 |
| 65 and over..... | 24.0 | 9.0 | 15.0 | 43.2 | 15.4 | 27.8 | 17.1 | 6.7 | 10.4 |

(table 4), as well as the geographic distribution of white practitioners, suggested no particular problem. The prevailing pattern of home and office care is such that white physicians provide care to white families and Negro physicians provide ambulant services to nonwhite families. A large proportion of indigent families received the equivalent of home and office care in the hospital out-patient departments prior to the establishment of the Baltimore City medical care program.

The story was vastly different for the non-white group. Not only was there an unfavorable ratio of physicians to population served, but the geographic distribution suggested that great difficulty would be experienced in finding personal Negro physicians for the families to be covered by the program. As a result of this analysis, attempts were made to attract new physicians into areas where a large-scale need existed.

Similar studies established the adequacy of clinical facilities in general hospitals and of neighborhood pharmacies, so that no unusual problems ensued in obtaining services of these agencies.

Indexes for Program Control

Progressive medical care administration must be based on a thorough understanding of the specific disease entities which a group presents. Information available from selected studies of out-patient records, morbidity studies, and discussions with physicians familiar with a given population segment provides a working basis for initial planning. However, as soon as possible, accurate and complete data on the conditions presented by a covered population should be obtained.

The Baltimore City medical care program provides for a general examination by one of the medical care clinics for every person referred to it. The results of this thorough medical survey yield invaluable statistics concerning the amount, classification, and severity of medical problems presented by an indigent population. A summary of this type of data is shown in table 5. However, some qualification is necessary. The persons included in this summary represent an unbiased sample of adults who have completed examinations at one of the participating medical care clinics. Although

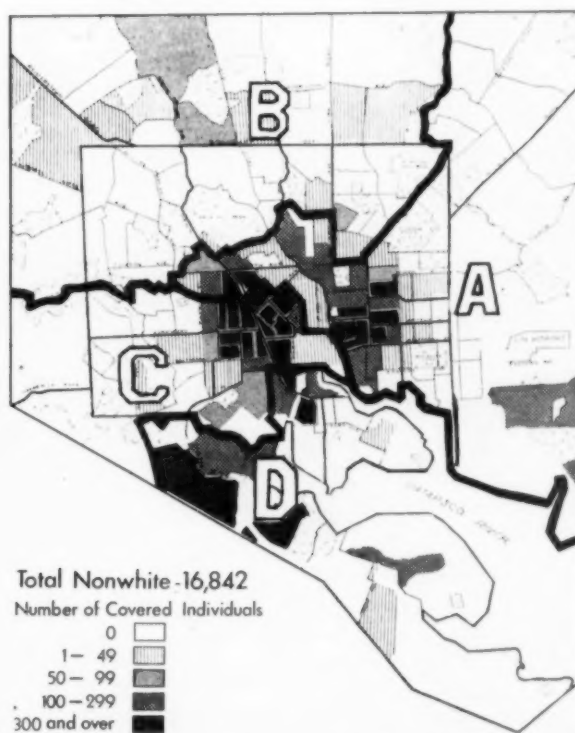
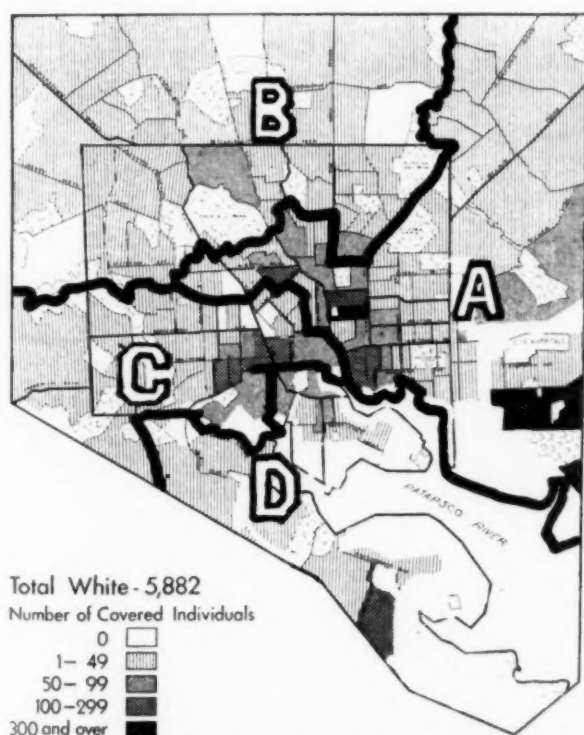


Figure 2. Population covered, by race and census tract, Baltimore City medical care program, 1951.

Table 4. Distribution of population and general practitioners, by race, Baltimore City, 1948

| | Total | White | Non-white |
|--------------------------------------|----------|----------|-----------|
| Total population..... | 943, 000 | 729, 000 | 214, 000 |
| General practitioners..... | 1, 120 | 1, 040 | 80 |
| Physicians per 1,000 population..... | 1. 19 | 1. 43 | . 37 |
| Population per physician.... | 842 | 701 | 2, 675 |

all persons registered at the clinic are scheduled for examination, approximately 12 percent fail to avail themselves of this privilege. In presenting the information available from the clinic histories selected, use has been made of the Sixth Revision of the International Lists of Diseases and Causes of Death, adopted in 1948, and a modification of the classification recommended for morbidity purposes has been employed.

The data in table 5 reveal a striking amount of disease diagnosed. (The high place of venereal diseases and diseases of the female genital organs would seem most unusual were it not consistent with early conclusions, drawn on the basis of population analysis.) However, the health administrator needs more information than the diagnosis alone provides. To assist

him in interpreting the data, the examining physician should supply, in addition to his diagnosis, information as to what limitation the patient's condition will impose upon his daily capabilities to perform useful work.

When the data in table 5 are further classified as to whether the diseases are disabling or not, they may serve as a basis for estimating requirements for specialists' and laboratory services. Any program for postgraduate instruction should seek to assist cooperating physicians in effective management of the more prevalent disabling conditions.

The study of clinical histories of the individuals included in this investigation showed that 850 or 87 percent of the persons examined had previous hospital or out-patient records, many of which were extensive in detail. Such records are believed to be characteristic of urban indigent groups and suggest that there should be some compromise with the concept of a complete physical examination for each individual in a medical care program.

Patterns of Utilization

In developing capitation fees, utilization rates were estimated from national as well as local surveys. In view of the unique distribution of care in the Baltimore City medical care

Table 5. Principal disease groups observed in general examinations of 975 indigent persons, aged 15-64 years, Johns Hopkins Medical Care Clinic, 1950¹

| Disease groups ² (listed in order of total prevalence) | Total prevalence | | Previously diagnosed | | Newly diagnosed | |
|--|------------------|------------------|----------------------|------------------|-----------------|------------------|
| | Number | Per 100 examined | Number | Per 100 examined | Number | Per 100 examined |
| Arteriosclerotic and degenerative heart disease (420-422)..... | 254 | 26. 1 | 187 | 19. 2 | 67 | 6. 9 |
| Venereal diseases (020-035)..... | 184 | 18. 9 | 163 | 16. 7 | 21 | 2. 2 |
| Diseases of digestive system (530-559) (571-587)..... | 134 | 13. 7 | 60 | 6. 1 | 74 | 7. 6 |
| Arthritis and rheumatism (720-727)..... | 112 | 11. 5 | 80 | 8. 2 | 32 | 3. 3 |
| Diseases of female genital organs (620-637)..... | 109 | 11. 2 | 56 | 5. 8 | 53 | 5. 4 |
| Psychoneurosis and psychosis (300-326)..... | 104 | 10. 7 | 94 | 9. 7 | 10 | 1. 0 |
| Diseases of the eye (370-379)..... | 87 | 8. 9 | 68 | 7. 0 | 19 | 1. 9 |
| Hypertensive disease (440-447)..... | 79 | 8. 1 | 59 | 6. 1 | 20 | 2. 0 |
| Other diseases of the circulatory system (450-468)..... | 78 | 8. 0 | 41 | 4. 2 | 37 | 3. 8 |
| Bronchitis and other respiratory diseases (500-527)..... | 77 | 7. 9 | 39 | 4. 0 | 38 | 3. 9 |
| Diabetes mellitus (260)..... | 51 | 5. 2 | 45 | 4. 6 | 6 | . 6 |

¹ Histories and examination results were evaluated by Drs. George Dana and George Brown, of the Johns Hopkins Medical Care Clinic.

² Figures in parentheses are International List numbers.

program, it has been necessary periodically to assess the extent to which facilities have been used by the covered population. In achieving this objective, it has been a standard procedure to develop suitable statistics from records which are essential for medical management or from an administrative point of view. Thus, clinic and drug utilization are determined by a study of the clinical histories and drug invoices for a systematic stratified sample of the covered population. Physician utilization studies are dependent upon the accuracy with which physicians check on a quarterly patient roster the number of visits made and have been somewhat difficult to accomplish because of the incompleteness of data provided. Nevertheless, the rough approximations which have been possible are administratively very worth while.

From the 1949-50 experience, utilization rates of benefits offered under the Baltimore City medical care program are shown in table 6.

By determining the amount of money which would be required to provide the services performed by the general practitioner if a fee for service were paid, it is possible to evaluate the correctness of the capitation fee. A similar mode of study is possible in regard to the clinic role in the program.

Age specific rates of utilization of services are often of great value in pointing out which segments of a covered population are the most costly elements. They assist also in planning extensions of the program to additional groups. An example of this type of data is shown in table 7.

Several other descriptions of utilization of services are worthy of mention, such as distribu-

Table 6. Utilization of services provided to eligible persons under the Baltimore City medical care program, fiscal year 1950

| Type of service | Number |
|---|--------|
| Physicians' visits per capita per year..... | 2.4 |
| Office..... | 1.5 |
| Home (day)..... | .7 |
| Home (night)..... | .2 |
| Clinic services per capita per year..... | 2.2 |
| Registration and screening examinations.... | .25 |
| General examinations..... | .25 |
| Clinic services (diagnostic and special therapy)..... | 1.70 |
| Prescriptions per capita per year..... | 3.1 |

Table 7. Utilization of drugs, by age groups,¹ Baltimore City medical care program, fiscal year 1950

| Age | Number of persons | Number of prescriptions | Total cost | Annual per capita utilization | |
|------------------|-------------------|-------------------------|------------|-------------------------------|--------|
| | | | | Number of prescriptions | Cost |
| Total..... | 1,554 | 4,800 | \$7,084.06 | 3.1 | \$4.56 |
| 0-4..... | 90 | 89 | 100.80 | 1.0 | 1.12 |
| 5-19..... | 513 | 359 | 511.42 | .7 | 1.00 |
| 20-39..... | 180 | 460 | 667.25 | 2.5 | 3.71 |
| 40-59..... | 198 | 1,205 | 1,788.83 | 6.1 | 9.03 |
| 60 and over..... | 573 | 2,687 | 4,015.76 | 4.7 | 7.01 |

¹ Based upon a systematic stratified sample of persons assigned on July 1, 1949.

tion of persons by length of membership in the program and by number of services received.

Recent analysis of length of stay on the program indicates a 25-percent reduction in need for clinical services during the second year of registration, indicating in part the advisability of developing a stable program of care for any population group.

On occasion, a distribution of individuals according to number of services received has been most illuminating. Using such a classification, it may prove possible to encourage a thorough review of a small number of persons who are receiving a markedly disproportionate share of total services provided in a given time period.

Failure to Use Services

In assessing the manner of utilizing program benefits a group which fails to respond by initial registration or to appear for general examination constitutes a problem which requires study. The administrator is not trying to create unnecessary activity. Rather he desires to introduce the concept of early care and prevention to a group of families who may not appreciate the value of preventive measures.

During the early operation of the Baltimore City medical care program, it was found that approximately 40 percent of the families failed to respond to notification to register at one of the medical care clinics. Analysis of the age, sex, and race characteristics of this group did

not indicate any striking difference from the equivalent statistics for the total of persons assigned. It was decided, therefore, to conduct a systematic inquiry of the response pattern of a block of families assigned to one of the clinics. The results of this investigation are shown in table 8.

As a result of this investigation, and after a careful study of the reasons for nonresponse noted by public health nurses, who were used on a trial study basis, a successful pattern of contacting families has been evolved, eliminating the nonregistrant group as a significant segment of the medical care population.

Variability in Utilization Patterns

In any medical care program, a range of patterns will develop, in addition to some average tendency. One of the most useful techniques in the application of statistics to operation analysis is the description of variability in utilization patterns in a manner which permits a value judgment and leads to an administrative decision.

Some of the practices which have been critically analyzed and which should be of interest to any administrator are:

1. Prescription-per-visit ratio according to physician.
2. Physician referrals for consultation per 100 person-years' coverage.
3. Percentage distribution of prescriptions classified proprietary or nonproprietary.

Table 8. Registration pattern of a block of assigned persons, according to notification procedure, Sinai Medical Care Clinic, 1949

| Notification procedure | Total persons notified | Number registered | Registration per 100 persons notified | Cumulative percent registered |
|--|------------------------|-------------------|---------------------------------------|-------------------------------|
| Introductory card including appointment..... | 879 | 537 | 61.1 | 61.1 |
| Follow-up form letter including appointment..... | 468 | 153 | 32.7 | 78.5 |
| Nurse's visit..... | 106 | 76 | 71.7 | 87.2 |

Determination of Tolerance Limits

If C = Total annual prescription cost

c = Cost of a single prescription

N = Total annual number of prescriptions

n = Annual number of prescriptions filled in a single pharmacy

Then $\mu = C/N$ and $\sigma = \sqrt{\frac{\sum c^2}{N} - \mu^2}$

and $\mu \pm 3\sigma/\sqrt{n}$ = Limits within which the mean prescription cost of an individual pharmacy with an experience of size n may be expected to vary by chance from the mean, based on the total experience.

4. Error rate in billing, according to pharmacist.

5. Mean cost of prescriptions, according to pharmacist.

No doubt there will be other indexes which will warrant study, depending upon the organization of the program for providing services. It is beyond the scope of this paper to demonstrate the techniques of using each of these indexes to point out patterns of possible injudicious use of the program's benefits. It will be of interest, however, to show how the analyses of data on two of these items contribute to reductions in the cost of administration.

Because the cost of drug service constitutes approximately 25 percent of total expenditures in the Baltimore medical care program, and because it was suggested that use of nonproprietary preparations whenever possible could result in significant savings, an analysis was undertaken of a systematic sample of prescriptions processed in the fiscal year 1951.

The proportion in each drug classification which proprietary drugs bear to the total varied within wide limits, representing over all 55.4 percent of the total prescription experience. The proprietary drugs were then submitted to a physician-pharmacist team who, with the guidance of a statistician, classified the prescriptions with reference to an official alternative and indicated the approximate saving in

cost. The results of this evaluation are shown in table 9 and indicate that \$16.30 per 100 proprietary drug prescriptions would have been saved if complete use had been made of the United States Pharmacopeia (10) preparations. When considered in terms of the total drug experience, this saving is equivalent to a 6-percent reduction, or \$9,000, for the volume encountered in the fiscal year 1951, during which the drug bill of the Baltimore City medical care program was \$150,000.

Procedures Useful in Cost Control

Basic medical and drug services are provided by some 300 physicians and 500 pharmacists cooperating with the Baltimore City medical care program. The mean number of patient visits per 100 persons on a physician's list will vary with each physician. Reports by druggists will vary, among other things, in the average cost of prescriptions filled in their establishments.

To discover differences in practices of pharmacies within the drug program, variations in mean cost per prescription were studied, using the procedure shown in the accompanying box.

Pharmacies filling 100 or more prescriptions annually were regarded as unbiased samples of the total annual prescription experience having known mean and variance. Individual pharmacy differences from the total mean were evaluated in terms of the tolerance limits established.

A detailed study was made of invoices submitted by pharmacies with mean prescription costs lying outside of expected limits. In a few cases, the differences appeared to stem from an unusual character of the sample. In some instances, however, this technique proves useful in uncovering consistent deviations from standard cost practices. Such deviations can be obtained in either direction and are of equal interest so far as cost analysis is concerned.

Determination of Quality of Medical Care

In assessing the quality of a medical care program, it is necessary first to seek a definition of the characteristic to be measured. A definition which provides for no possible method by which the attribute "quality" can be quantitatively fixed will lead into a blind alley. How-

Table 9. Distribution of proprietary drugs by number and by cost status of equivalent United States Pharmacopeia preparation, Baltimore City medical care program, fiscal year 1951

| Drug group | Total number proprietary prescriptions | Status of U. S. P. equivalent | | | | Saving per 100 proprietary prescriptions |
|------------------------------------|--|-------------------------------|----------------------------|-------------|-----------------|--|
| | | Number not available | Number available | | | |
| | | | Number without cost saving | With saving | | |
| | | | | Number | Cost difference | |
| Total..... | 573 | 193 | 177 | 203 | \$93. 50 | \$16. 32 |
| Allergy preparations..... | 28 | 20 | 4 | 4 | 4. 60 | 16. 43 |
| Analgesics..... | 64 | 30 | 19 | 15 | 6. 65 | 10. 39 |
| Antibiotics and sulfonamides..... | 31 | 13 | 3 | 15 | 8. 70 | 28. 06 |
| Cardiovascular drugs..... | 80 | 20 | 38 | 22 | 12. 75 | 15. 94 |
| Dermatological preparations..... | 17 | 14 | 2 | 1 | 2. 00 | 11. 76 |
| Genitourinary preparations..... | 9 | 6 | 2 | 1 | . 30 | 3. 33 |
| Gastrointestinal preparations..... | 72 | 26 | 34 | 12 | 5. 25 | 7. 29 |
| Hematics..... | 17 | 2 | 5 | 10 | 9. 50 | 55. 89 |
| Hormones..... | 4 | 2 | 1 | 1 | . 30 | 7. 50 |
| Hypnotics and sedatives..... | 35 | 2 | 12 | 21 | 6. 75 | 19. 29 |
| Narcotics..... | 21 | 9 | 12 | | | |
| Respiratory preparations..... | 101 | 15 | 21 | 65 | 20. 85 | 20. 64 |
| Tonics and placeboes..... | 27 | 11 | 6 | 10 | 3. 45 | 12. 78 |
| Vitamins..... | 26 | 11 | 2 | 13 | 10. 55 | 40. 58 |
| Supplies and sickroom aids..... | 21 | 2 | 19 | | | |
| Other..... | 20 | 10 | 7 | 3 | 1. 85 | 9. 25 |

ever, in developing this new scale, broad measurement intervals will suffice until experience permits a finer scale. Necessary conditions are:

1. A standard based on total patient benefit.
2. Until such a standard is developed, a criterion based on program components. This criterion should include measureable attributes, such as performance of physicians, accuracy and completeness of medical care records, and accuracy of laboratory determinations.

3. The availability of resources is a limiting factor in performance and should be considered when interpreting quality measurement.

One attempt has been made to establish criteria which would allow for an evaluation of therapy employed in the Baltimore City medical care program insofar as data on drug prescriptions can provide information on this subject. By conference with an expert committee, a classification was devised which distributes prescriptions according to their therapeutic advisability. The principal considerations involved in establishing the classification were: (a) therapeutic, chemical, and pharmaceutical compatibility of ingredients; (b) rationale of treatment, considering the condition involved and the patient's age; and (c) availability of more effective drugs.

The results of this study are in process of analysis and will be reported later.

Conclusions

Statistical methods represent an efficient way to gather information and to make it useful for administrative decision.

The particular contribution of the statistician to problems of administrative analyses as these analyses concern determination of quality lies in the development of well-defined classifications of performance with previously assigned values.

Built into the program from the start was a statistical study unit. The work is going forward for approximately 3 percent of the city's population who receive public assistance, with continued attention given to the guidance that may be derived from statistical analyses. The administration considers such "chart and compass" facilities to be indispensable.

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Selective Case Finding in Syphilis Control

By GEORGE MOORE, M.D., M.P.H., and MALCOLM T. FOSTER, M.D., M.P.H.

IN VIEW of the gradual decline in the number of cases of syphilis reported by State health departments year by year, most public health authorities have been aware of the need for radar-like methods to pinpoint undiscovered syphilitics in the population. Evan Thomas (1) has suggested that when the prevalence rate of syphilis is low, blood-test screening of total populations is not entirely feasible. As the incidence of syphilis in the population decreases, the cost of finding a case by mass blood-testing increases proportionately. In recent years, mass blood-testing campaigns have been waged in many of our major cities, such as Charleston, S. C. (2), Philadelphia, Pa. (3), Atlanta, Ga. (4), Detroit, Mich., and New York City. Because of variable results and high initial costs, the more recent surveys have emphasized screening of high-prevalence groups or areas rather than entire populations. The selective approach has proved its merit; nevertheless, the campaigns have required considerable personnel, effort, and money. They have also proved to be short-range procedures, as the populations tested are usually prone to reinfection.

Several States, notably Mississippi and North Carolina, have recently become interested in long-range, selective, group-screening methods. In Mississippi (5), the State Board of Health has considered placing emphasis on the population for survey rather than on the individual. They point to surveys as an effective method of

finding cases of late and congenital syphilis at low cost. Better education is also listed as an advantage.

In North Carolina, the State Board of Health has organized a venereal disease survey team consisting of six to eight trained Public Health Service investigators. At the request of a county health department, this team arranges and conducts blood-test surveys of select-group populations. Drs. Wright and Sheps (6), of Chapel Hill, N. C., discussing screening methods, suggest that the major value of such surveys is to reduce the backlog of old cases and to prevent congenital syphilis.

Interest is being shown in the sociomedical aspects of venereal disease more than ever before, and it is natural that this interest should enter the realm of screening methods. For example, H. Garrick Williams (7) describes his experiences with blood testing in pool halls and taverns, where 12.8 percent of the persons tested were reactors. W. Lloyd Warner and associates (8) have studied syphilis prevalence and community structure, using as their material a blood-testing campaign in a Georgia town. They found 0.6 percent white and 13.6 percent Negro reactors, and determined that groups with a lower social status contributed the highest percentage of positives. The authors write, "It is important that groups of the population with higher prevalence and incidence rates be identified so that activities can be directed toward them. . . ." Other authors have pointed out the effect of socioeconomic factors and marital status on syphilis prevalence (9, 10).

This paper describes briefly three methods of screening employed by the Cumberland County Health Department during the past year. These

Dr. Moore and Dr. Foster are with the Cumberland County Health Department, Fayetteville, N. C. Dr. Moore, of the U. S. Public Health Service, is venereal disease control officer and Dr. Foster is the county health officer.

methods suggest long-range blood-test surveys, aimed at high-incidence groups, that can be adapted to most local health departments because of the limited cost and unnecessary "extras."

Diversified Industrial Surveys

From October 19, 1951, to June 15, 1952, the venereal disease division of the Cumberland County Health Department, consisting of two investigators, one clerk and the venereal disease control officer, visited 36 small industrial plants and, at semiweekly intervals, the county jail. The plants were selected for their unskilled and semiskilled employees, regardless of race, and included laundries, fertilizer plants, construction groups, city sanitation units, feed mills, coal and fuel companies, lumberyards, foundries, cement works, and brickworks, as well as the 654 county jail prisoners.

Plants employing over 50 men were not included in the survey, as arrangements had been made for the State venereal disease survey team to visit the county later. The time required for the surveys averaged about 1 hour a week for each of the four members of the venereal disease division. Thus, the survey fitted into the usual routine of venereal disease control work and caused no interruption of regular activity of the division. In fact, a diversified activity was begun which proved to be highly profitable.

A total of 1,483 persons was tested serologically in the 8-month period. Negroes comprised 57 percent of the group (the percentage of Negroes in Cumberland County is approximately 26 percent); 82 percent were males. By age, 54 percent were 15-30 years of age and 46 percent were 31 years and older. Table 1 illustrates the results of the survey.

Of the 244 positive or doubtful reactors, 221 or 91 percent have been brought to diagnosis. Eighty-six or 39 percent were found to need treatment. Twenty-six had late latent syphilis; 8 tertiary syphilis; 1 was a congenital syphilitic; and 51 were treated for early latent syphilis. It was significant that although 54 percent of the total group tested was comprised of youths between 15 and 30 years of age, the percentage of those in the same age range who

were found to need treatment was only 18 percent. Of the treated syphilitics, 82 percent were 31 years and older.

Eleven-Day Industrial Survey

From June 17 through June 28, 1952, the State venereal disease survey team invited by the Cumberland County Health Department completed a survey of the larger industrial plants (over 50 employees) in the county. All arrangements for the survey, including publicity, scheduling of plants, and conferences, had been made before the team's arrival. Schedules were presented at a short meeting with the team on June 16, and the survey began the next morning.

During the 11-day period, 2,360 serology tests were taken covering 37 industrial plants and special groups. The plants were of the same general description as listed for the first survey but also included textile mills, large manufacturing plants, and migrant fruit pickers. The composition of the group tested and the number of serologic tests for syphilis (STS) taken are shown in the accompanying tabulation.

| Survey group: | STS taken |
|-------------------------|--------------------|
| Industrial surveys..... | 2,029 |
| Migrant labor..... | 49 |
| Street surveys..... | 205 |
| Movies 3)..... | 77 |
| Total | ¹ 2,360 |

¹ 68 tests hemolyzed, or quantity not sufficient, or broken in shipment.

The group was weighted in favor of males (77 percent) and whites (56 percent). Forty-five percent of the group were 15 to 30 years old; 37 percent, 31 to 35; and 18 percent, 46 to 70. Results of the survey are shown in table 2.

By age, the group that demonstrated the highest percentage of positives for the Negro race was 31-45 (35 percent); the highest group for the white race was aged 46-70 (5 percent). The 15-30 age groups of both whites and Negroes proved to be the least infected groups. By sex, more Negro males in the 46-70 age group were infected (33 percent) than Negro females in the same age range (17 percent), showing that infected Negro females were younger than infected Negro males. Of 152

reactors that have already been brought to disposition, 88 or 58 percent have required treatment for syphilis; 3 percent were biological false positive reactions. The 88 diagnosed as active syphilis were distributed as follows:

| Stage of syphilis: | Number | Percent |
|--------------------------------------|--------|---------|
| Early latent, not previously treated | 16 | 18 |
| Early latent, reinfection or relapse | 10 | 11 |
| Late latent, not previously treated | 15 | 17 |
| Late latent, reinfection or relapse | 37 | 42 |
| Congenital syphilis | 1 | 1 |
| Tertiary syphilis | 9 | 10 |

Since "outside" personnel had been invited into the county for this survey, an estimate of survey expenses was computed. Total expense for the survey team borne by the State Board of Health was \$892.00, and for the Cumberland County Health Department, \$55.00. The cost per blood test was 40 cents and per positive serology test, \$3.73.

This survey, then, has been inexpensive in view of the high percentage of reactors found. Furthermore, as a result of the survey, familial contacts of the reactors will be found and brought to the clinic and more cases will be diagnosed and treated. The differences in percentages of positives and doubtfuls between the two surveys is probably explained by the fact that surveys of large industrial plants cannot be as selective as those of smaller plants. Differences are significant only in Negro females.

Table 1. Positive and doubtful reactors in diversified survey

| Race and sex | Number examined | Reactors | |
|--------------|-----------------|----------|---------|
| | | Number | Percent |
| Negro: | | | |
| Male | 724 | 167 | 23.1 |
| Female | 128 | 54 | 42.2 |
| Total | 852 | 221 | 26.0 |
| White: | | | |
| Male | 488 | 12 | 2.5 |
| Female | 143 | 11 | 7.7 |
| Total | 631 | 23 | 3.7 |
| Male: | | | |
| Negro | 724 | 167 | 23.1 |
| White | 488 | 12 | 2.5 |
| Total | 1,212 | 179 | 14.8 |
| Female: | | | |
| Negro | 128 | 54 | 42.2 |
| White | 143 | 11 | 7.7 |
| Total | 271 | 65 | 24.0 |
| Grand total | 1,483 | 244 | 16.5 |

Table 2. Positive and doubtful reactors in 11-day industrial survey

| Race and sex | Number examined | Reactors | |
|--------------|-----------------|----------|---------|
| | | Number | Percent |
| Negro: | | | |
| Male | 767 | 175 | 22.8 |
| Female | 193 | 48 | 24.9 |
| Total | 960 | 223 | 23.2 |
| White: | | | |
| Male | 915 | 24 | 2.6 |
| Female | 317 | 7 | 2.2 |
| Total | 1,232 | 31 | 2.5 |
| Male: | | | |
| Negro | 767 | 175 | 22.8 |
| White | 915 | 24 | 2.6 |
| Total | 1,682 | 199 | 11.8 |
| Female: | | | |
| Negro | 193 | 48 | 24.9 |
| White | 317 | 7 | 2.2 |
| Total | 510 | 55 | 10.8 |
| Grand total | 2,192 | 254 | 11.6 |

Health Certification

From July 1, 1951, to June 30, 1952, data on health certificate examinations were compiled in an effort to determine the value of screening for syphilis the group required to have health certificates.

The Cumberland County Health Department's code on health certification follows closely the State rules and regulations in requiring that employees of restaurants, cafes, grills, taverns, hotels, tourist camps, trailer camps, abattoirs, meat markets, frozen-food lockers, poultry establishments, and food-processing plants be examined for infectious diseases before they are employed. The city ordinance also requires taxi drivers to be examined. State laws include examination of teachers, premarital applicants, prenatal-care patients, barbers, beauticians, cosmetologists, and welfare applicants (for training schools and boarding homes, and for placement). Certain colleges and institutions require health examinations for entrance; and domestics in private employ are required by State law to obtain a "health card."

The enforcement of the statutory laws regarding health certification is left to the health

department in all cases except the following: beverage plants and bakeries (department of agriculture); ice cream and dairy plants (both department of agriculture and health department); taxi drivers (police); teachers, barbers, and beauticians (State). Health cards must be renewed each year and may be obtained from either the health department or private physicians.

Although examination at the health department includes chest fluoroscopy and serologic test, many applicants request a blood test only from the health department and then visit their private physicians for completion of the examination.

A check on laboratory reports for the fiscal year revealed that over 5,250 residents of Cumberland County (96,000 population) requested a serologic examination at the health department for either health certification or compliance with the prenatal law; 5,190 examinees professed to have had a negative history for syphilis and were tabulated as a single group. Others who had previous records of venereal disease or who admitted previous infection were referred to the venereal disease clinic for their health cards. The laboratory data on the 5,190 health examinees who had not been reactors or syphilitics at any previous examination are shown in table 3, by race and reason for examination.

A percentage of 4.6 positives and doubtfuls for the group was considered somewhat high since nearly all the examinees professed to have had previous negative serologic tests (10 percent of the donors in the 11-day survey had had syphilis). Moreover, the group was 46 percent white and included many children, skilled workers, and professionals.

Analysis of the returned health certificate application forms, of which there were 3,703 for the fiscal year, including former venereal disease patients, disclosed a positive or doubtful reaction in 262, or a percentage of 7.1. One third of these 262 reactors were treated for active syphilis in various stages:

| <i>Stage of syphilis:</i> | <i>Percent</i> |
|--|----------------|
| Late latent, not previously treated..... | 27 |
| Early latent, reinfection or relapse..... | 42 |
| Late latent, not previously treated..... | 2 |
| Late latent, inadequate treatment or reinfection | 19 |
| Tertiary..... | 19 |

It is interesting to note that the largest single group of examinees (1,007) was the unemployed. This group was characterized by a high percentage of young females (86 percent) and of positive serologic tests (11 percent). In fact, there were more unemployed girls (870) who applied for health cards than there were girls who had jobs (751) in cafes, restaurants, taverns, or bars, and who worked as

Table 3. Laboratory data on serologic tests of health examinees, fiscal year 1952

| Type of examination | White | | | | Negro | | | | Total | | | |
|---|-----------------|------------------|----------|---------|-----------------|------------------|----------|---------|-----------------|------------------|----------|---------|
| | Number examined | Percent of group | Reactors | | Number examined | Percent of group | Reactors | | Number examined | Percent of group | Reactors | |
| | | | Number | Percent | | | Number | Percent | | | Number | Percent |
| Health cards (food handlers, domestics, etc.)..... | 1, 888 | ----- | 23 | 1. 2 | 1, 860 | ----- | 133 | 7. 2 | 3, 748 | 72. 2 | 156 | 4. 2 |
| Prenatal-care examinees..... | 83 | ----- | 0 | 0 | 780 | ----- | 75 | 9. 6 | 863 | 16. 6 | 75 | 8. 7 |
| Premarital examinees..... | 260 | ----- | 1 | . 4 | 75 | ----- | 5 | 6. 7 | 335 | 6. 5 | 6 | 1. 8 |
| Other (beauticians, barbers, and welfare school, and teachers' certificates)..... | 150 | ----- | 0 | 0 | 94 | ----- | 0 | 0 | 244 | 4. 7 | 0 | 0 |
| Total..... | 2, 381 | 45. 9 | 24 | 1. 0 | 2, 809 | 54. 1 | 213 | 7. 6 | 5, 190 | ----- | 237 | 4. 6 |
| Total, exclusive of prenatal-care examinees..... | 2, 298 | ----- | ----- | ----- | 2, 029 | ----- | ----- | ----- | 4, 327 | 83. 4 | 162 | 3. 7 |

Table 4. Effect of marital instability

| Marital Status | Nonreactors (percent) | Reactors (percent) |
|---|-----------------------|--------------------|
| Single----- | 21 | 13.3 |
| Married----- | 66 | 63.9 |
| Separated, widowed, divorced, second marriage----- | 13 | 22.8 |

maids, domestics, and cooks. Theoretically, a health card is held by the employer as long as his employee works for him, but an unemployed girl may keep her card until she is employed. The existence of a large military reservation in the county may explain, at least in part, the problem of the unemployed female group.

Health certification for this area, therefore, must be considered an effective method of screening for syphilis.

Efficacy of Screening Methods

In order to gain some estimate of the amount of syphilis in Cumberland County, the persons who applied for health cards might be taken as a representative sample since they include all classes, races, and age groups in the county. By adjusting this sample group to the entire county population by age, sex, race, and occupation, using the 1950 population figures, it was determined that the prevalence of syphilis in Cumberland County amounted to approximately 1,900 cases (reactors) of whom 1,440 were Negro and 460 were white.

Through venereal disease control activities of the health department and private physicians, approximately 1,230 reactors were brought to disposition during the past year. Of these, 738 (60 percent) were found by the three above survey methods—diversified and industrial surveys and health certification. Of the remainder, 295 (24 percent) were discovered through the central activities of the venereal disease division, excluding surveys, and 196 (approximately 16 percent) were diagnosed by private physicians. Thus, the 1,230 reactors represent 64.7 percent of the total estimated reactor problem in Cumberland County.

As most of the reactors in the survey had late latent and tertiary syphilis, it would seem that the three methods of screening served primarily

to reduce the tremendous backlog of previously untreated or inadequately treated syphilitics. And by screening 9,093 individuals from a population of 65,000 between the ages of 15 and 70 years, 738 reactors were discovered. In other words, screening 14 percent of the population by survey brought to light 39 percent of the estimated reactor problem of the county. This points to the efficacy of selecting certain population groups for screening techniques.

Venereal Disease, a Sociomedical Problem

Social data were obtained on persons tested in the 11-day industrial survey and analyzed in an effort to study the relationship of social instability and the acquisition of venereal disease.

It was determined that, by marital status, 21 percent of the total group (2,192 donors) were single; 66 percent were married for the first time; and 13 percent stated that they were separated, divorced, widowed, or married two or more times. The latter denotes a group with somewhat high marital instability. Whites and Negroes of both sexes showed equivalent percentages of marital difficulty.

These individuals were also questioned about history of previous venereal disease and civil court records such as felony. Ten percent stated that they had had venereal disease; 5 percent reported disfavor in court action; and 86 percent gave clear records for both difficulties. Here, a large difference appears between the races in that 19 percent of the Negroes previously had venereal disease and 8 percent reported a previous court record. These percentages for whites were 3 and 2 percent, respectively. Tables 4 and 5 illustrate the social significance of these factors on the acquisition of syphilis (reactor group).

These data suggest that marital instability is associated with multiple sexual contacts and

Table 5. Effect of promiscuity and antisocial behavior

| Social data | Non-reactors (percent) | Reactors (percent) |
|--------------------------------|------------------------|--------------------|
| Previous venereal disease----- | 4.6 | 50.6 |
| Previous court record----- | 4.4 | 8.8 |
| Neither difficulty----- | 91.0 | 40.6 |

increased opportunities for acquiring venereal disease. Also, antisocial behavior and promiscuity (as shown by high percentages of previous venereal disease) are significant factors in the acquisition of venereal disease. The differences between whites and Negroes in antisocial behavior may account for the large differences seen in rates of syphilis between the races. This last correlation is significant statistically. A previous report from this area on venereal disease rates of prisoners also substantiates these data (11).

That this problem is not one of race per se is shown by arranging the various groups and plants tested in order of highest percentage of reactors. Unskilled worker groups contribute the most reactors and skilled laborers and professional workers, the least. College entrants (68 percent Negro) and teachers (83 percent Negro) were groups that demonstrated no positives. Furthermore, of 606 serologic tests taken of Negro freshmen at the Fayetteville State Teachers College in 1951, only 3 were positive, a percentage of 0.5.

Summary

1. Three screening techniques as employed by the Cumberland County Health Department are described. These screening measures may be adapted to most local health departments, as they aim at economy, long-range needs, and high prevalence groups of the community.

2. An 8-month period of selective screening of small industrial plants proved to be a diversified, yet highly profitable, screening method. About 17 percent of the donors were reactors.

3. Employing the State venereal disease survey team, large industrial plants were screened in an 11-day period and approximately 12 percent of the donors were reactors.

4. Health certification during the year screened 5,190 examinees who professed negative serologies prior to examination; about 5 percent were found to be reactors.

5. By screening a total of 9,093 individuals from a population of 65,000 (aged 15-70), 738 reactors were found. In other words, by careful screening of 14 percent of the population, 39 percent of the estimated total reactors in the county were found.

6. Disposition of the positive serologies found in the industrial surveys indicated a majority of late latent and tertiary cases of syphilis in the older age groups. A significant percentage of early latent syphilis was found, however.

7. Screening by health certification is an effective method of finding early cases of syphilis, as the examinees for the most part represent a high-incidence group prone to reinfection.

8. The effect of marital instability, promiscuity, and antisocial behavior on the acquisition of venereal disease is offered as a basis for selecting groups in the population for survey. Antisocial behavior, particularly, may help to explain the differences in rates between Negroes and whites.

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Chronic Disease Mortality In Influenza Epidemics

Deaths from specific nonrespiratory chronic diseases have contributed to the total excess mortality during epidemics of influenza and pneumonia since 1935, a period when mortality from these diseases declined rapidly. Public Health Monograph No. 10, "Excess Deaths From Chronic Disease During Influenza Epidemics," considers this situation and reviews excess mortality from causes other than influenza and pneumonia in epidemics during the period 1918-34.

This paper is the fourth in a series on epidemics of influenza and pneumonia. The first three, published in *Public Health Reports*, include "Mortality from influenza and pneumonia in 50 large cities in the United States, 1910-1929" (1930), "Excess mortality from causes other than influenza and pneumonia during influenza epidemics" (1932), and "Trends and epidemics of influenza and pneumonia, 1918-51" (1951).

Weekly data from large cities in the United States during the periods 1918-34 and 1935-51 for 35 and 56 cities, respectively, are the basis for the study reported in Monograph No. 10. Weekly excess death rates from influenza and from other causes during the entire period 1918-51; total excess deaths during whole epidemics; concurrent peaks for deaths from influenza and pneumonia and from nonrespiratory causes during epidemics; total amount and percentage of excess mortality from influenza and pneumonia, and from nonrespiratory causes; distribution of mortality in four geographic regions; and diseases that account for excess deaths credited to causes other than influenza and pneumonia are discussed.



Public Health MONOGRAPH 10

This summary covers the principal findings presented in Public Health Monograph No. 10, published concurrently with this issue of *Public Health Reports*. The authors are members of the staff of the Division of Public Health Methods, Public Health Service.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch, Public Health Service. Copies will be found also in the libraries of professional schools and the major universities, and in selected public libraries.

. . .

Collins, Selwyn D., and Lehmann, Josephine: Excess deaths from chronic disease during influenza epidemics. Public Health Monograph No. 10 (Public Health Service Publication No. 213). U. S. Government Printing Office, Washington, D. C., 1953. Price 20 cents.

The State of the Nation's

public
health
services

Reports from the 51st annual conference of the Surgeon General of the United States Public Health Service and the Chief of the Children's Bureau with the State and Territorial health officers, mental health authorities, and hospital survey and construction authorities.

Report on Programs and Problems, 1953

1 Excerpts from a statement
by **LEONARD A. SCHEELE, M.D.**
Surgeon General of the
Public Health Service

Our country is still in a period of international emergency and national mobilization. The development of strong defense against the spread of aggression necessitates continued sacrifices by every American.

As public health workers, we have had an important share, from the beginning, in the program for economic and technical assistance to underdeveloped areas that need help to become strong allies. In sharing our knowl-

edge and skills, real progress has been made in the control of disease and the promotion of health.

Many State and local health agencies have joined with the Public Health Service in staffing these overseas health programs. Despite the general shortage of public health personnel, and although we have not been able to provide all the personnel our own Government and the struggling health agencies of underdeveloped countries have asked for, we have made a very good showing. These programs are so vital to the survival of a free world that the Public Health Service intends to tighten its belt even more so as to help meet their minimum staff requirements. We will continue to call on health agencies for help. (See report by Dr. Hyde, page 188, this issue.)

Health Material Requirements

During the past year, the Public Health Service has developed a smoothly running

organization to handle allocation of critical metals for construction of hospitals and health facilities. We are now concerned with the specialized technical staff work that must be done if civilian health supplies are to be available in the event of full mobilization.

This means that experienced and technically competent personnel must be available to work with industry in projecting potential demands and productive capacity 4 or 5 years ahead. The Defense Production Administration has delegated this responsibility to the Public Health Service. With the active cooperation of the health and medical supply and equipment industries, and the military forces, our Division of Civilian Health Requirements has made good progress in developing the basic data.

We expect in the immediate future to begin making similar estimates of facility requirements that would come with full mobilization. It will be important for State hospital survey and construction agencies to participate. We shall need to know what it takes to keep the existing hospital and health plant going; and what will be needed 4 or 5 years ahead for renovation and repair of buildings, replacement of equipment, maintenance of supplies, and so on.

Of special concern are items already in short supply, as well as those that would become critical under full mobilization. For example, already completed is a study of penicillin requirements, and our proposals for increased production have been approved by the Defense Production Administration. Recommendations soon will be completed on such items as surgical bandages, sutures, dental supplies and equipment, hypodermic needles and syringes, X-ray film and machines.

With these and to-be-developed data, the Public Health Service intends to keep abreast of the production situation so that civilian needs may be safeguarded in the face of increased demands and heightened competition for essential supplies and equipment.

Environmental Health

There are many encouraging signs of the emergence of practical solutions to some of the

"ONCE MORE the conference of the Surgeon General of the United States Public Health Service with the State and Territorial Health Officers—established by Congress as a statutory function 50 years ago—has assembled. In recent years, the effectiveness of this annual exchange of views has been strengthened by the companion conference of the Chief of the Children's Bureau and by concurrent conferences with the State hospital and mental health authorities. These actions testify to the common interests of health administrators from all parts of the country and to their desire to work together as a united force for the protection and promotion of the Nation's health."

Thus the Surgeon General opened the 51st conference of State and Territorial health authorities held in Washington from December 8 to 11, 1952.

One of the important purposes of these meetings is to bring the health authorities up to date on important health developments and prospects on the national scene. Several reports which have more than transient interest are presented in these pages in abbreviated form. Other material stemming from these discussions will appear in later issues of Public Health Reports. Included here are excerpted reports from—

| | |
|---------------------------------|------|
| 1. Dr. Scheele: | Page |
| Programs and Problems..... | 174 |
| 2. Mr. Thurston: | |
| Federal-State Relations..... | 181 |
| 3. Dr. Eliot: | |
| Child Health and Welfare.... | 183 |
| 4. Dr. Hyde: | |
| International Health Staffing.. | 188 |

critical problems created by new environmental factors in our rapidly changing society, at the same time that substantial progress is being made in long-established sanitation activities.

Radioactive Hazards

Steady progress has been made in the public health control of hazards incident to the use of radioactive materials and radiation-producing machines. Several State health departments already are operating radiological health programs—in recent months, for example, pilot programs have been initiated by the New Jersey and the California health departments. Progress also has been made on the Colorado Plateau in controlling radiation hazards inherent in the mining and milling of uranium.

Interstate Milk Shipping

The program for the certification of interstate milk shippers—recommended by the State and Territorial health officers for the past 8 years—has reached a point where additional support for the Public Health Service's share in these joint activities is essential. Despite lack of adequate funds, the Service has conducted during the past year a highly successful demonstration project. It has been shown that effective certification of interstate milk shippers can be achieved with the active participation of State and local health departments, agricultural agencies, and the dairy industry. If this modern method for the marketing of safe milk is to be extended beyond the limited area covered by our demonstration, all of the States, as well as the Public Health Service, will have to increase their activity.

Poultry Sanitation Code

The development of a poultry sanitation ordinance and code is going forward satisfactorily. This project is being conducted with full participation by the poultry industry and by law enforcement agencies.

Raw Garbage Feeding of Swine

The Executive Committee of the Association of State and Territorial Health Officers has been considering the need for appropriate legislation and supporting control measures in connection with the practice of feeding raw garbage to swine. The Public Health Service has been cooperating closely with the U. S. Department of Agriculture, and we believe that joint planning and action in this field will bring about better control of many swine diseases, including trichinosis and others of public health importance.

Up to now, our mutual efforts in this field have made headway slowly, because of lack of clear epidemiological data demonstrating the importance of trichinosis as a public health problem. Last summer's rapid spread, from coast to coast, of vesicular exanthema in swine, traced to the feeding of raw garbage, illustrates the hazards of the practice and its role in the

transmission of disease both to man and to domestic animals. This vesicular exanthema outbreak has stimulated reconsideration and brought forth new support from all quarters. Now is the time for State health departments to renew their cooperative efforts with their State agricultural agencies in legislation and control. The Public Health Service is tightening up its interstate action in this field, and we are prepared to provide States with technical and consultative service for their intra-state operations.

"Fringe Area" Housing

There is still a large residuum of substandard housing which presents basic sanitation problems—chiefly in urban and suburban areas, and not limited to "rural slums." "Fringe areas" still are growing faster than are our efforts to forestall serious health problems. Mobilization has brought with it a variety of housing sanitation problems. More than this, the morbidity and mortality rates from home accidents, the relation of housing conditions to cardiovascular disease, to arthritis and rheumatism, to the aging, and to many other conditions that stand among the Nation's unsolved health problems point day after day to the health agency's responsibility for action in the hygiene of housing.

Accidents in the Home

In home accident prevention, the Public Health Service and participating States have made some progress in developing the basic data essential for planning in this field. In fact, the time has come to pull together the recently acquired knowledge and experience and to evaluate what we have learned. Such an effort is planned for January when representatives of State, county, and municipal health agencies, voluntary organizations, and Federal agencies meet at Ann Arbor for a conference on home accident prevention.

Our Chemical Environment

The report of the House Select Committee to Investigate the Use of Chemicals in Foods and

Cosmetics focuses attention on the growing importance of the chemical environment as it affects human health. Much remains to be learned about the potential hazards, as well as the potential benefits, that may be inherent in the introduction and use of many new chemical compounds. With respect to our knowledge of the health effects of the chemical environment, we are just about at the same level of understanding as public health pioneers were three-quarters of a century ago in their knowledge of bacterial causes of disease. Our first steps, therefore, must be thorough research programs aimed at finding answers to fundamental questions.

Fluoridation Programs

In the advancement of dental public health, the fluoridation of public water supplies needs to be skillfully interpreted to the people of our communities. Although more than 500 towns are now benefiting from fluoridation, progress in applying this preventive measure has been impeded in some communities by misinformation. There have been some court actions, referendums, and opposition by groups and individuals.

Such situations are not uncommon in the history of public health progress. The early efforts to install chlorination of water supplies met with opposition, sometimes with unfounded fears of "poisoning." Again, we are called upon to exercise a high degree of public health statesmanship. The skeptics must be convinced that our epidemiological and laboratory studies are valid and that the benefits of fluoridation are not to be discarded lightly in the face of uninformed opposition.

Communicable Disease Control

New disease entities are being identified; new agents for prevention and control of well-known infections are being tested; and the problems of identifying the etiologic agents in unusual outbreaks are increasing—in short, future progress in the control of communicable disease depends upon the efficiency of our epidemiological and research techniques. In disasters or enemy attack, success in protecting

large populations from rapid spread of disease depends upon a well-organized, highly efficient, nation-wide epidemiological service.

During the past few years, the Public Health Service has been emphasizing the epidemiological approach in its communicable disease control and microbiological research undertakings. The sectional research program in microbiology set up in the National Microbiological Institute and the epidemic intelligence service set up in the Communicable Disease Center are the two major contributions of the Public Health Service to the attainment of such an organization. The institute and the center are, of course, developing their programs together as a team.

Emergency Reserves

The Public Health Service has made repeated attempts to build up a more extensive and vital inactive Reserve Corps, particularly for active duty in the event of full mobilization or disaster and to provide officers for assignment to the States for duty in defense-impacted areas. We have been handicapped by lack of funds.

We are, however, about to launch an experimental expansion of the inactive Reserve Corps in the engineer component. The idea is to have available a reserve of engineers who could be called to duty in the vicinity of their usual place of employment. Recruitment will be largely from sources other than State and local health departments—industries, public utility companies, universities, and units of governments having engineering personnel.

We plan to use our present engineering staff as recruiting agents and to keep inactive reservists informed on developments in environmental and general public health fields. Engineer reservists are expected also to have opportunities for active duty—from a few weeks as special consultants, to a year or two on special missions. Later we hope to conduct special training along the lines employed by military reserve organizations. This demonstration effort should provide experience that will be of value in the eventual development of an expanded inactive Reserve in components other than engineering.

Sectional Research Program

The aim of the sectional research program is to encourage laboratory and epidemiological research on infectious agents through the operation of a nation-wide network of regional and coordinating laboratories especially skilled in microbiological investigations.

At present, 98 laboratories, organized in 11 sectional groups, are participating. More than 10 percent are in State and local health departments, and representatives of several State laboratories are on the advisory committee helping us to develop this program. The Public Health Service has awarded research grants to those laboratories requiring aid in order to participate, and next year we hope to increase the amount available for these grants.

Epidemic Intelligence

The companion epidemic intelligence service has completed its first full year of service. We have been encouraged by the results and by the cooperation which has been extended by the State and local health departments, the schools of public health and medicine, and others who have teamed up with us. A second group of epidemiologists have completed their initial training at the Communicable Disease Center and are now in the field, bringing the number of medical officers in the intelligence service up to 32. By expanding this corps, and by stepping up various types of laboratory and field research, the Public Health Service is better prepared to discover and combat disease outbreaks, whatever their origin and wherever and whenever they occur. We stand ready to answer the call for epidemic aid from any quarter of the Nation.

Disease Reporting

Efficient morbidity and mortality reporting is a fundamental requirement in the investigation and control of communicable disease. The increasing strength of State activities in vital statistics and morbidity reporting is evidence of progress in this field.

Plans are going forward for an expansion of State and national reporting of animal diseases.

Although collection of data on animal diseases is a function of the United States Department of Agriculture, the Public Health Service has offered consultative assistance in the planning stages because of its many years of experience in the reporting of human diseases. I hope that the State health departments will offer similar assistance to their State agricultural agencies.

Poliomyelitis Prevention

Reports by several investigators within the past few months indicate that we may be on the threshold of development of one or more useful immunization agents for poliomyelitis (see *Public Health Reports* for January 1953, pp. 105-107). Much research remains to be done, but the immediate potentialities of gamma globulin pose major practical problems for Federal, State, and local health agencies and the medical profession. Close and active cooperation in the development of policies and procedures relating to blood collection, serum processing, and allocation are required of all hands.

Venereal Disease Control

By the middle of 1953, venereal disease control programs will have attained almost complete conversion to out-patient treatment of syphilis. This is indeed a triumph and one in which all of us share. It is the result of research, pharmaceutical production, and public health and private medical practice. Now every private physician can be an efficient venereal disease control officer, giving ambulatory treatment to patients in his office, while State and local health departments maintain the important supporting services of case finding, contact tracing, referral, treatment of many patients unable to pay for private care, and education.

State health departments are establishing about 70 prevention and control centers in strategically located urban clinics. They aim to provide the best in venereal disease diagnosis, treatment, epidemiological services, and education. From them will radiate services to physicians, local health centers, hospitals,

and social agencies in the area. There are here, also, opportunities for professional training in cooperation with universities and medical schools.

Chronic Disease Control

In tuberculosis, cancer, heart disease, diabetes, arthritis, and other chronic diseases we might well aim for levels of control that involve every practicing physician giving ambulatory treatment, either preventive or curative, in his office. Thus as a key element in its chronic disease effort, the Public Health Service continues to support an unrelenting search for case-finding techniques that may be applied on a wide scale and for therapies that may ultimately be placed in the hands of the general practitioner as well as the specialist.

Certainly, facing up to the problems of chronic disease and an aging population, public health agencies need to encourage and develop many new types of partnership. There is strong support for chronic disease control and for health services to the aging. Yet State and local health services in most of these fields are scanty and scattered.

While new techniques for chronic disease control and hygiene of the aging remain in a twilight zone between experiment and widespread use, it may be that a "bridge" type of community institution with research, educational, and limited service functions is needed to speed the sound application of scientific advances. (See description of this type of institution in *Public Health Reports* for January 1953, pp. 8-9.)

Rheumatic Fever Prevention

All interested in health have long looked forward to the day when a sound preventive program against rheumatic fever could be proposed and endorsed. Recently, the American Heart Association and its affiliated Council on Rheumatic Fever and Congenital Heart Disease formed a committee on prevention of rheumatic fever. This group proposes, essentially, two main lines of action: (1) early and adequate treatment with penicillin of all cases of streptococcal infections; and (2) long-

term prophylactic use of sulfadiazine or oral penicillin in rheumatic patients. (See *Public Health Reports*, January 1953, pp. 12-15, for the full text of the statement.)

These recommendations of the leading specialists in this field represent a milestone on the road to control of rheumatic fever and its crippling companion, rheumatic heart disease. Implementation of the community programs which makes such control possible should be given high priority.

Rehabilitation

At the 1950 meetings of this conference it was recommended that the Public Health Service and the State health agencies undertake studies of the public health aspects of rehabilitation. We are now preparing the final report of a Public Health Service committee and task force on rehabilitation which was formed last year with the cooperation of the Office of Vocational Rehabilitation.

Community action for the improvement of rehabilitation facilities and services is widespread. Spurred by Federal aid for the permanently and totally disabled, many communities are planning and developing service programs with a minimum of health department participation. Unless State health officials move quickly and think through their responsibilities in this field, they stand to lose opportunities for significant leadership in improving health services generally and particularly in the fields of chronic disease and impairment where we already have operating programs.

Hospital Licensure

State health and hospital agencies increasingly are involved in the licensure of hospitals and related institutions. At their request, the Public Health Service has undertaken a compilation of existing regulations for institutional licensure. Guide materials for the development of licensing procedures and techniques are being prepared.

Licensure as a phase of hospital and related institutional care is destined to come into greater prominence as programs for the aging,

for convalescent care, and for rehabilitation expand. The subject requires a great deal more study, but such study requires more funds than the Public Health Service yet has had to devote to it.

Manpower Shortages

The shortage of professional and technical personnel which has engaged our attention for two decades continues to be a serious problem. Trained workers, never available in numbers adequate to meet the needs of organized services and institutions, are in steadily increasing demand from a number of sources. We must, therefore, make strenuous efforts toward more effective utilization of our present supplies of professional and auxiliary health personnel. It is highly probable, for example, that a number of duties now performed by physicians could be delegated to nonmedical personnel.

Critical evaluation of all activities, constant and intensive recruitment, in-service training, careful consideration of salary levels, opportunities for advancement, and satisfying work experiences—taken together—constitute main weapons against the current shortage. Essentially, this means that we must try to get well-qualified workers into public health, or workers with the potentiality for high qualifications, and we must make our field a career service for them—one which they need not and will not leave for another.

In nursing—a particularly difficult area—several State health agencies during the past year have been active in the conduct of nursing surveys. Some hospital divisions in State health departments also have taken the initiative in stimulating hospitals to evaluate the utilization of nursing personnel. The coming year should see increased activity in both these fields.

Re-examining Local Services

We in the Public Health Service believe that the time has come to re-examine carefully the entire concept of, and structure for, the delivery of community health services. The present pattern has served its purpose well. However, new forces have emerged in the total social

fabric. We are confronted with many new problems. Marked changes have occurred in the physical environment. The general standard of living has improved markedly. There are better means of communication and transportation. New scientific bases are available for prevention, diagnosis, and treatment of illness. There is a wider public understanding of personal and community health problems.

Are we taking advantage of these many new technological, social, and economic forces to make available the best possible health services at the lowest per capita cost? Are we organizing and administering programs that merely maintain the status quo, or are we getting down to the "grass roots" and finding out what precisely are the health needs and the best means of meeting them? Are we experimenting with new techniques?

To illustrate: In approaching a study of the amount and kinds of nursing service required to meet the minimum needs of local health departments, the Public Health Service has run head on into the basic fact that to consider the needs of a single type of service is not enough. The fact is, we have too long fractionated our approach. It is not enough merely to extend the study to cover other types of public health personnel. We must go much deeper.

Today's public health problems require a wide range of professional skills, facilities, and services. We have become increasingly aware that the newer programs do not always fit into the traditional structure. Many local health organizations as now constituted cannot cope with the problems. Local health organization is indispensable, and it must be strengthened. We must learn new ways of organization as well as new operating techniques.

Any new approach to local health services must be carefully planned after well-conducted studies. Such studies must be so designed as to yield results applicable to the whole field of public health, not merely to the solution of discrete problems. They must be of sufficient scope and longitude to insure valid conclusions. They must be focused more upon the human community than upon the professions which serve the community. They must draw upon the social sciences for their design, methodologies, and conduct.

The need for such appraisal of current practices and for the development of more effective and economical methods for different types of communities is of vital concern to all health workers. The Public Health Service hopes to begin the difficult first step of such studies—the planning—in the near future. But we cannot, and we will not, promise any hasty “appraisal” or quick results. But we shall do our best to add some useful knowledge to the science and art of public health.

Report on Federal-State Relations, 1952

2

Excerpts from a statement
by JOHN W. THURSTON
Deputy Administrator of the
Federal Security Agency

This meeting is significant because it is indicative of growth in health programs and responsibilities. It is also significant because it demonstrates maturity in Federal-State relations—serious, cooperative consideration of nation-wide health problems.

Back of the growth lies a long history of cooperation, the development of a system for recognizing, meeting, and solving health problems. We have created a structure that is enduring and that has met the test of time. The machinery for action-in-partnership is here and it works. It has become a part of our social heritage, extending beyond individuals and beyond shifts in political alignments. The only real danger we face is to fall victims of the twin evils of arrogance and complacency—to lose that sense of hopefulness and vision and hard work that brought us where we are today.

Results of Partnership

The results of the partnership have been substantial. Even as we reflect on the achieve-

ments of the past, however, we are wrestling with the problems of the present, in part created or intensified by earlier victories. The changing environment, the general aging and mobility of our population, the swift pace of industrial expansion bring us face to face with new problems. Health problems today are much more subtle and complicated than they were in the past.

The greater the awareness of the new factors, the more effective will health services be. Health workers must ally themselves with other social forces in the local and national community. The partnership must not only grow stronger between the various levels of government—local, State, and Federal—but must also branch out laterally. Adequate health services in the future call for genuine integration with related social programs, such as welfare and rehabilitation and education, and for close rapport with other community services that affect health, such as housing and community planning.

The Federal-State partnership is based on respect and trust, on the recognition of individual rights and mutual responsibilities. The flow of power is a natural one, from the individual citizen to his local community and then to his larger community, the State and the Nation. The interrelationship between the citizen and his government, and within the various levels of government, is delicate and subtle, yet strong, like a fine fiber.

An American Invention

The structure that binds us together is, in fact, unique in man's governmental efforts. It is an American invention, rooted in our social fabric and peculiarly suited to our geographic needs. It has developed out of a combination of circumstances—our pioneering traditions, our strong community bonds, our patterns of emerging social obligations. At its base is a federated system of government—a system of local, State, and Federal authorities—with each member of the partnership having its own set of duties, powers, and obligations.

The American federated system is also unique in its sources of strength and its possibilities for action. It preserves and extends

local independence and at the same time permits national concentration on national problems. Our citizens have different loyalties without necessarily having conflicting loyalties. We meet national needs best when local resources are strongest.

It is true that problems may not always be the same. The needs of some States may differ somewhat from the needs of other States, and local problems may not always be comparable to those of the State. But there is a core of problems that require joint undertaking, that confront all the people of the United States. And these problems demand the united efforts of our Federal-State-local system.

The result of the system then has been a fusion of effort which helps us to pull together our resources instead of scattering them or instead of quarreling over them. It is this kind of teamwork that has enabled us to undertake cooperative endeavors, to share ideas, resources, and facilities for a common national goal.

Unity and Responsibility

This is not to imply that all our endeavors have been marked by complete harmony. Nor would we want to pay the costs of such a harmony, the costs of smugness and stagnation. We have had differences, but they have been honest differences. But from these differences, from the hammering out of compromises, has come greater understanding and a higher kind of unity.

When we come to the differentiation of responsibilities, we find that certain broad categories of responsibility fall, quite typically and quite naturally, to the Federal partner, just as others fall to the States and the communities. For example, it is an accepted obligation of the Federal partner to conduct research and experimentation in new health techniques; to develop and set nation-wide standards; to collect national statistics of various kinds; and to meet problems which are interstate, international, or so new or so fluid that no State or local agency could possibly undertake them.

Financial aid is, of course, an important type of assistance offered by central to local governments. But it is by no means the only, or even

the most important, kind of aid. I think the grant-in-aid principle is firmly established in this country; it is one of the buttresses of our federated system of government. It is to be expected, however, that at any particular time one member of the partnership may be stronger in resources than another, and that there will need to be a continual balancing of forces in the interests of greatest economy and productiveness.

More important than the financial aid is the necessity for all groups to do their share in a unified, constructive way. The Federal-State health system is not a matter of giving but a process of sharing.

Trail Blazing by States

Sometimes it is charged that the Federal Government dominates the States. I know something about the Federal regulations governing grants for health purposes. And I see nothing in the Federal-State system that prevents any State from seizing the initiative and blazing the trail in new health programs. I do not think the States have been stifled because they have been the recipients of Federal grants. I do not know of many bold experiments or new programs that have been vetoed in Washington.

Certainly there have been experiments, new programs, new techniques. There will be more. There must be more if there is to be real progress. The flexibility of the Federal-State structure, its adaptability for many kinds of uses, leaves room for a wide variety of new programs, for administrative and technical pioneering.

This very meeting is evidence not of Federal coercion, but of healthy give-and-take discussion and of general agreement on goals to be reached and methods to be followed. Here we find a core of dedication, of good will, of social conscience, and professional competence that will enable this Nation to attain new levels of health.

I think we can all take pride in the health structure we have built, in our strong chain of health defenses. It has carried us a long way in a relatively short span of years. Despite calumnies, despite set-backs, despite the fears of some, it will carry us much further. I am

confident that the people, as well as the health professions, will be satisfied with no less in the future.

Report on Child Health And Welfare

3

Excerpts from a statement
by **MARTHA M. ELIOT, M.D.**
Chief of the
Children's Bureau

The United States is becoming a nation of old people. While it is true our aged are increasing in number, as a nation we are maintaining our youth. We are actually growing younger faster than we are growing older.

During the past decade, while the population over 65 years of age increased 37 percent, the population under 5 grew 55 percent. These children now are increasing our elementary school population in great numbers. Soon the effect of this increase will be felt in the high schools.

This fact has many implications for health, welfare, and education programs for children and youth. It means that during the current decade, we will be facing new and ever greater responsibilities in providing services for them.

Today in the United States there are nearly 48 million children under 18 years of age. The characteristics of this child population are of significance to us.

In rural areas live 43 percent of our children. Almost one-half of all children belong to families with incomes of less than \$3,000 a year.

An impressive reduction has taken place in infant and maternal mortality for the country as a whole. There are, however, many counties, largely rural, which lag a decade or more behind the more metropolitan counties. The majority of the counties where higher infant mortality rates prevail are in the southeastern and southwestern parts of the country, where some of our most economically depressed families live, many of them migratory workers, Negroes,

Spanish-speaking people, Indians. These people are living under serious disadvantages. They need our continuing help.

The needs in such areas are basic in character—adequate nutrition, housing, sanitation, public health services, maternal and child health services. Equally important are the acceptance and utilization of these services by a population which often does not understand too well what they are.

The Premature Infant

The leading cause of infant mortality throughout the Nation is prematurity. At least 7 percent of all live-born infants are premature, and about 60 percent of deaths in the first month of life are associated with prematurity. The inclusion of birth weight on birth certificates by the States is now making it possible, through the matching of birth and death certificates, to increase greatly our information about prematurity.

For over a decade health departments have done considerable educational work in the area of prematurity, lending incubators, providing consultation to hospitals, giving nursing care in the home, and providing opportunities for nurses and physicians to obtain additional training in this field. These efforts have been accelerated and extended in the past 5 years.

Among the newer significant developments has been the increase in the number of State health departments which are working with hospitals and medical schools in developing centers for the care of premature infants—centers which serve as the focal point of community programs for premature infants. Such programs are demonstrating that mortality among prematures can be reduced appreciably. These good results are even being extended to infants weighing less than 2 pounds.

The birth of a premature infant constitutes a serious economic problem for almost every family when it happens. The average duration of hospitalization is 30 days and the average cost per infant is almost \$500, and, naturally, the smaller the premature, the higher the cost. Clearly such a cost added to the cost of maternity care is often calamitous to families with low incomes.

That 16 State health departments are assisting families in bearing the costs of medical and hospital care, at least in demonstration areas, is encouraging. The development of such programs, though still in their inception, is among the outstanding accomplishments of health departments in recent years.

The increased knowledge about prematurity gained from these programs, together with an appreciation of what the financial burden of premature birth means to families, is leading State health departments to give more consideration to the possibilities of reducing the incidence of prematurity.

This involves, in the first place, extending prenatal care facilities so that women can have good care during pregnancy. Women who have poor care or none are about three times as likely to have a premature baby as those who have good prenatal care. The major known causes of prematurity are complications of pregnancy, which are prone not only to cause premature labor, but also to decrease the chances of survival of infants born prematurely. For these reasons, several States which have been active in caring for premature infants are also directing their attention to maternity programs, increasing prenatal care services, and providing medical and hospital care for women with complications of pregnancy. Herein lies the greatest possibility of reducing the incidence of prematurity, of lowering the costs of care for premature infants, of reducing the number of blind infants with retrolental fibroplasia, and of lowering fetal and infant mortality.

School Health Services

Health services for children of school age constitute a considerable proportion of the maternal and child health programs of many States. Health and education departments are giving greater attention to the use of screening techniques for finding children in need of medical attention and to assisting these children in securing the services they need. If less time were spent on frequent examinations of children in the schools and more time on screening and follow-up, on medical consultation to the

school, and on the utilization and development of local resources for diagnosis and treatment, most school health programs would undoubtedly be more productive of good results.

The pamphlet "Better Health for School Age Children," prepared by a committee of staff members of the Children's Bureau, the Office of Education, and the Public Health Service, has been widely distributed. Through its clear and specific statements on the subject (summarized in the November 8 issue of the *Journal of the American Medical Association*), it makes a real contribution to the literature in the field.

The Rural Problem

Earlier I referred to the fact that children living in rural areas are at a disadvantage in some respects. Medical specialists are for the most part concentrated in urban areas. Children in rural counties, moreover, receive considerably less medical supervision than those in or near cities. But it is particularly with regard to specialized services, such as those for premature infants and crippled children, that rural children are at a disadvantage. With our greatest medical skills concentrated in the teaching medical centers, one of our major problems is to help children in rural areas have the benefit of such skills.

State maternal and child health and crippled children's programs have pioneered in bringing to rural areas specialized services for certain groups of children, such as premature infants and children with orthopedic and other handicaps. In recent years, in addition, several health departments have developed pediatric consultation clinics in rural areas which bring at regular intervals the services of a well-trained pediatrician associated with a teaching hospital to the area. Not only are significant services thereby provided children who are referred for consultation by physicians in private practice and by public schools and other community services, but the clinic also serves a teaching purpose in the consultative relationship between the pediatrician and local practitioner. Children in need of further diagnostic work or treatment which cannot be obtained locally are provided these services in an urban teaching hospital which in this respect takes

on a regional function. This relationship of the local pediatric or special clinic with the teaching hospital is a most important factor in raising the quality of care. Extending arrangements such as these would greatly improve the quality of care for children throughout the country.

Crippled Children

State agencies have continued to make gains in the past year in extending services for crippled children, a group for whom there is much support from the public. Parents' groups particularly have become much more active in recent years in supporting these services. Although some of these groups have tended to emphasize certain conditions, they are nevertheless a constructive force which can be of great assistance to all of us in program development.

States are experimenting, too, with new types of services. Since the beginning of the epilepsy demonstration program in Maryland in 1950, some seven or eight other States have also begun epilepsy programs. Other States are planning them. Through the active participation of organized public health services, the benefits of research in therapy can be brought to epileptic children all over the country.

Progress is also being made in the further development of the regional congenital heart disease program. California's program is now in operation serving the far West, Alaska, and Hawaii. The program centering in Illinois is under way and plans for Texas and Maryland have been approved. Programs such as these are representative of the dynamic nature of public health today and its readiness to experiment with new methods of providing service.

Interesting developments are also taking place in services for children who have cleft palate. This group of children has been included in virtually all of the State crippled children's programs since the passage of the Social Security Act, but recently, in a number of States, some of the traditional concepts of treatment are being questioned and modified. Again, the necessity of considering the child first as a growing individual and second as one with a defect in a particular part of his body is being emphasized.

Surgery for cleft palate is not the solution for all children. For those who do need surgery, careful consideration must be given to the age at which this will be done. Many children, without surgery, have satisfactory speech with the aid of a prosthesis. Too many children who have had several operations still do not have a closed cleft or satisfactory speech.

One of the most encouraging aspects of the newer concepts in this field is the recognition that the care of the child with a cleft palate is not the province of the surgeon alone. Some of the best work is being done in those centers where each child is carefully studied by a team—the plastic surgeon, pediatrician, orthodontist, prosthodontist, speech therapist, medical social worker, public health nurse, and others—which considers all the aspects of the situation and reaches agreement on what is the best procedure to be followed for this particular child. Such teamwork offers new opportunities for greatly improved services in a technically difficult area. Opportunities for training in this field are being offered through the University of Illinois Medical School and services for crippled children in Illinois.

Children of Migrants

A different problem, that of children of migratory agricultural workers, demands attention. Their number varies with the season of the year, but it ranges from 250,000 to 1,500,000. These children are, economically and socially, the most depressed group of children in the whole country. Few stay long enough in any one place to call it home. They grow up without having enough of anything. They lack food. They lack adequate shelter, clothing, medical care, and education. Sickness and mortality rates are high among them. These children contribute to the high infant mortality rates in the Southeast and the Southwest. The problem of the families to which these children belong is fundamentally an economic one. Its solution lies in some far-reaching social and industrial measures. Until these measures are undertaken, attention must be directed to the serious health problems of the children. Some States are already helping these families, but in many localities their needs are still unmet.

To be effective, not only must the several agencies involved within a State make a concerted effort; there must also be cooperative interstate efforts. Among the measures that need to be taken are: adequate housing; environmental sanitation; health and medical care services for infants, young children, and expectant mothers; health education that will reach the different cultural groups; and interstate cooperation.

One of the principal causes of death among infants and children of migratory workers is dysentery, a fly- and water-borne disease. Adequate sanitary engineering, fly control, and screening of houses will do much to reduce this mortality. Even as we help peoples in Europe, Asia, and Latin America to adopt sanitary measures, we must help people in some sections of our own country to do the same.

Bringing adequate health services to these families is not a simple matter. One of the basic problems in providing services for migrants is the lack of coverage by local health units. When we have the basic services in public health that we need in rural areas, at least some of the migrant's health problems will be solved, or the mechanism will be available for solving them. I would give the strengthening of the local health units a very high priority among our public health needs but even with basic coverage attained, the job of increasing services suddenly for large numbers of people for a short period of time is a difficult one.

Mobile units may have to be considered. Probably additional staff—physicians, nurses, medical social workers, nutritionists, health educators—will be needed to provide individual services and to make arrangements with social agencies for child welfare services. In view of the poor resources these families have, the provision of medical and hospital care must be included.

Provision of day-care centers would constitute another constructive health, as well as welfare, measure. Since both parents and older children in these families usually work, young children are commonly left pretty much on their own. In a few States, day care is being provided, but additional financial support is needed if any headway is to be made in the provision of this service.

State and local health and welfare departments which have the basic organization to do the job must take the responsibility for the administration of health and welfare services to meet the needs of migrants. Migrants should not be set off from the rest of the population but should be enabled to participate in all community services to the fullest extent possible.

Juvenile Delinquency

One of the most serious byproducts of the general insecurity brought about by periods of national and international unrest is the marked increase in juvenile delinquency. Adolescence is a period when youth is naturally in revolt against the adult world. In seeking their own place in the world and establishing their identity, adolescents tend to band together. They may easily fall into antisocial patterns of behavior with which we are familiar in this country. They may also be exploited as in totalitarian countries. It is our responsibility to understand the behavior of adolescents and to help direct it into constructive channels.

Because this problem is becoming increasingly serious, the Children's Bureau during the past year has been giving a majority part of its attention to it. We have established in the division of social services a newly organized juvenile delinquency branch. A special juvenile delinquency project is being financed through private contributions to the Child Welfare League of America. This special project is working closely with the Children's Bureau. We have had a series of conferences with many leaders in this field and with public and private agencies, one of the most recent being with the National Health Council. The Children's Bureau has published several factual pamphlets about juvenile delinquency, and the December 1952 issue of *The Child* is entirely devoted to this subject.

These are a few of the facts we have brought to public attention:

About 350,000 children were referred to the juvenile courts in this country in 1951. Most of these boys and girls are 15 to 17 years of age.

About 1,000,000 were picked up by the police for delinquent behavior.

The number of delinquent children seen in

juvenile courts has increased 19 percent between 1948 and 1951.

Some 50,000 to 100,000 children are detained each year in local jails, often with adult criminals.

As a result of the increased birth rate, it is expected that by 1960 there will be 45 percent more children between 10 and 17 years of age than there were in 1950. Even if the rate of delinquency does not increase, the number of children picked up by police may rise to 1,500,000 by 1960.

We can do much to prevent delinquency, and we can provide juvenile delinquents with the treatment they need, much better today than in the past.

The Mentally Retarded

Another important problem is becoming of increasing concern to public agencies, that of the mentally retarded. The parents of these children are increasing their efforts to secure help for them. In public programs, when both funds and personnel are short, priorities must be given to some activities. Unfortunately, the mentally retarded are not high on the priority list. Yet as we learn more about these children and their problems, we find that many with help need not be nonproductive nor a financial drain. Access to good diagnostic services is a first step in a constructive approach to the problem. Let us hope that in the near future, health, education, and welfare agencies can give consideration to how their resources can be utilized best in helping these children and their families.

Personnel Shortages

The need for personnel continues to be a major problem and probably will continue to be for some time. Progress, I believe, is being made in improving the teaching of preventive medicine and public health in medical schools so that more medical students will be graduating with some knowledge of the modern concepts and services of public health agencies and an increased respect for public health. Because of this shortage of personnel we continue to emphasize the need for increasing oppor-

tunities for training. The principal means of doing this is through the provision of adequate stipends for fellowships. There is need to give some long-term fellowships—2 or 3 years—to assure fuller training in the many aspects of child health that will be required by future leaders in our maternal and child health programs. This is essential if we are to maintain our gains of the last few years.

Evaluation of Services

Large sums of money are spent by Federal, State, and local governments to promote children's health and welfare. The needs of children and their parents for aid in these respects are great, and it is to the advantage of all that the physical and emotional health and social functioning of children and youth be the best possible. That evaluation of health and welfare programs and practices is needed is obvious.

To carry on evaluation studies is a huge and long-range task. The Children's Bureau plans to provide research consultation to those States requesting it in one or another of the following program areas in 1954:

1. Foster care of children who are homeless, neglected, or for some other reason need care outside their own homes.
2. Adoption services.
3. Delinquency control and services to delinquents.
4. Health supervision of children through child health conferences or school health programs.
5. Services to crippled children, especially those services that are not medical.

There is a limit to the amount of consultation services the staff can give. As a first step in undertaking such studies, a report on the methodology of research is being prepared.

The various subjects touched on here, though briefly, demonstrate the broad interest of the Children's Bureau in children and the close relationship between child health and child welfare. The physical, social, and emotional problems of children are inseparable. Only as all the professions involved work together in a genuine spirit of service can the interests of children be served in the way we all want them to be served—to the highest degree possible.

Report on International Staffing

4

Excerpts from a statement
by HENRY van ZILE HYDE, M.D.
Technical Cooperation
Administration

The resolution of the Association of State and Territorial Health Officers (see page 189) constitutes clear recognition of the fact that from now on the United States is inextricably involved in the health problems of the world. It further recognizes that this is a phase of public health which is not exclusively a Federal responsibility—not solely a responsibility of the Public Health Service, nor of the Department of State nor any other Federal agency. This statement gives clear recognition to the fact that American health leaders, at all levels, must from now on encompass a world responsibility while discharging their domestic responsibilities.

Your resolution is encouraging not only to the Federal agencies concerned with international health, but to the World Health Organization, the Pan American Sanitary Bureau, and, more particularly, to those countries that need your leadership and assistance in improving their health. It will serve as a beacon to them in searching the way out of the morass of ill health.

Mobilizing State Leadership

For some time we in the national agencies have been seeking ways whereby the full force of American public health leadership could be brought to bear upon the problems of health abroad. We are well aware that leadership in public health in this country resides to a very large degree in the State and local health departments. A practical question is: How can we avail ourselves of your leadership and the leadership under your influence in tackling international health problems?

The Public Health Service is taking a first step toward an answer. Taking into account that the international phase of public health is a long-term responsibility with workaday aspects, the service is transferring its Division of International Health to the Bureau of State Services. This move should integrate more closely and bring into proper balance within the Service the domestic and international phases of its total public health responsibility. It is hoped that this move will strengthen the intimacy of the relationship of the Service to the State health officers in discharging international responsibility. It will provide, likewise, opportunity for full utilization of the regional offices in international work.

Approaches and Principles

How can we mobilize full strength in this program? How can we bring it fully to bear on the international problem? We need to seek new ways and to seek these together. The problem has been discussed with a number of State health officers. In every case we have found enthusiasm and interest, with reservations only concerning ability to contribute as largely as the State would wish.

There are certain underlying principles governing the program that should be understood:

1. It is truly a joint endeavor with each country, not a unilateral effort.
2. The specific content of each country's program is determined jointly with the ministry of health in the country concerned. It is not laid out in Washington nor by the Americans in the field.
3. Program can be influenced most effectively in the field, by field visits, when the annual program is being developed. It would be brash to attempt to mold or veto programs at great distances, particularly when they are to be carried out in a foreign setting.
4. The United States is furnishing leadership, not the mass of workers. Quality, not quantity, is required—competent, experienced public health leaders to give direction to pro-

Whereas, the Association of State and Territorial Health Officers recognizes the importance of improving world health as a sound basis for insuring world peace, and

Whereas, the United States of America has achieved pre-eminence and leadership in the field of public health, largely due to the training and experience of all public health personnel in State and local health departments and the U. S. Public Health Service, and

Whereas, by cooperation in the extension of modern public health services to other countries in the world, as well as the interchange of views and experience through the assignment abroad of trained United States personnel there has de-

veloped a better mutual understanding of the problems concerned and distinct improvement in local and domestic health conditions: And, therefore, be it

RESOLVED, *That the Association of State and Territorial Health Officers, assembled in annual sessions at Washington, D. C., December 8-11, 1952, hereby pledges its continued interest and support to the international health programs now being carried out and strongly recommends that State and Territorial health officers encourage and, by active participation wherever possible, extend this great movement in international health, and thereby help to promote the spirit of good will and peace throughout the peoples of the world.*

gram development and to train and direct indigenous workers.

Personnel and Objectives

In the 18 countries in Latin America, where the program is most advanced, there are fewer than 100 American technicians directing programs involving over 6,000 native personnel. In the Near East, African, and Asian areas, there are now in the field of health and sanitation about 95 technicians under an authorized budget providing for 158 positions. Although some increase of the authorized budget might be forthcoming, it is not expected that the number of personnel required will skyrocket.

The object of the program is, of course, to build strong, permanent, self-supporting national and local health services. It is necessary first to create widespread public demand for such services—a demand sufficiently strong and clear to constitute effective political pressure. Such a demand can be generated through sufficiently widespread, successful demonstrations of effective health services. At the same time, it is necessary to train indigenous technicians, both professional and subprofessional, and to develop true public health leadership within

the country. The program is, thus, basically one of demonstrations and training. It is a program that requires competent, experienced leadership abroad working under the stimulation and broad guidance of the best at home.

A Pioneering Step

In seeking means for full participation in this program, an important pioneering step has recently been taken in the signing of a contract between the Commonwealth of Massachusetts and the Technical Cooperation Administration of the Department of State. This contract establishes the principle of cooperation and sets up a working method that is already providing action. The principles inherent in it are important.

The contract establishes a special relationship between the Department of Public Health of the Commonwealth of Massachusetts and the Technical Cooperation Administration, with particular reference to the Point IV health program in Pakistan. The contract, in its preamble, recognizes the fact that the personnel and facilities of the Department of Public Health of Massachusetts are particularly well suited for participation in the activities contemplated under the program for the improvement of public health and sanitation in a rela-

tively underdeveloped country. The Commonwealth on its side recognizes that its personnel under such an arrangement will gain invaluable training and experience in work abroad.

Article I defines the functions of the Department of Public Health of the Commonwealth as follows: (1) to make available the ability and services of the commissioner of public health as chief consultant to the Government of Pakistan and the Technical Cooperation Administration in the development of cooperative programs of public health in Pakistan; (2) make available the abilities and services of such specialized personnel of the Department of Public Health as the commissioner may consider advisable to serve as additional consultants; (3) be responsible, in cooperation with the appropriate officials of the Government of Pakistan or other participating countries and the directors of United States technical cooperation in such countries, for the planning of cooperative programs for the development of public health; (4) endeavor to provide, as expeditiously as is practical, technicians to perform services as the needs of the cooperative public health and sanitation programs in Pakistan or other participating countries require and as requested by the Technical Cooperation Administration; (5) assume responsibility for participating in the selection of candidates for Technical Cooperation Administration grants for training.

Certain funds are transferred to the Commonwealth of Massachusetts in order to enable it to carry out these functions.

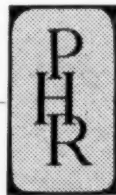
TCA-Massachusetts Team

It is important to notice that this contract sets up a partnership between the Technical Cooperation Administration and the Commonwealth of Massachusetts' Department of Public

Health—a partnership dedicated to assisting a specific country through a cooperative program. The State will have a major voice in the form that such a program might take. It will give intellectual leadership, stimulation, and direction. Staffing will be only a part of the job. Under such a contract State personnel can be assigned to foreign duty without loss of rights within the State service. Such personnel can continue to grow under the leadership and direction and observation of the State health officer.

The contract is not so rigid as to exclude other methods of employment. Particularly, when it is advantageous to do so, the personnel may be commissioned in the Reserve Corps of the Public Health Service. Whether in the employ of the State or commissioned, personnel when on assignment to the foreign country will work as an integral part of the Point IV mission to the country, receiving technical stimulation, guidance, and leadership from the State health officer in close conjunction with the Technical Cooperation Administration and the Division of International Health of the Public Health Service.

A contract such as that which has been entered into with Massachusetts may be applicable in the case of other States which wish to participate in this program. In some States quite a different pattern might be required. It has been suggested that in certain States it might be desirable to establish a new, separate entity of government under the State health officer. In a number of States specific legislation may be required in order to provide for leave of absence or to encompass service abroad within the framework of State service. The matter needs to be explored on a State-by-State basis because of the variations in legislation and resources.



1950 Census Findings on Health Occupations

About 1,400,000 persons, or 2.5 percent of the total civilian labor force in the United States in April 1950, were employed in a group of 17 health occupations. These estimates are derived from preliminary summarizations of the 1950 Census of Population prepared for the Division of Public Health Methods, Public Health Service. Persons on active duty with the Army, Navy, and Air Force, as well as those unemployed, are not included.

The figures for 1950 as shown in the accompanying table are based on a preliminary summary and are subject to change. Figures for 1940 are from the 1940 Census of Population, adjusted where necessary to conform to the 1950 classification. Final 1950 figures and adjusted 1940 figures for the United States will be published by the Bureau of the Census in the spring of 1953 in the series P-C reports.

Since the census figures differ from those available from other usual sources, it seems important to urge caution in the use and interpretation of the 1950 census findings on health occupations. An attempt is made in the following notes to discuss some of the points to be considered in using the new data.

Physicians

Almost 192,000 persons in the civilian labor force in April 1950 were reported employed as physicians and surgeons in these census tabulations. The increase during the decade 1940-50 was 26,000, or 15.6 percent. During the same period the civilian population showed a net gain of 14.1 percent.

The estimated number of physicians, based upon reports from the American Medical Association, was 205,300 in the spring of 1950. This figure includes 9,900 retired, or not in practice, and 7,500 in the armed forces, leaving 187,900 in active civilian practice. When the 1948

AMA age distribution is applied to the 1950 total and adjustments are made for those retired and in military service, the active civilian physicians fall into the following groups in terms of age at last birthday: 24,200 under 30 years of age, 134,700 from 30 through 64, and 29,000 aged 65 or older as of April 1, 1950.

The census figures are about 8 percent higher than the AMA estimates for the combined age groups under 65 years. The census tabulation shows 26,700 physicians under 30 years of age, an excess of about 2,500 over the AMA. For the age group 30-64, the census enumerated 144,500, about 9,800 more than the AMA. At the younger age the census enumeration may have included some medical students taking clinical training and hence reported as physicians. Obviously, the census count must include, in addition to persons with medical degrees, many thousands in such occupations as chiropractic, dentistry, osteopathy, and veterinary medicine. On the other hand, physicians reporting that they spent all, or a major part of their time, in teaching or administrative work, for example, would not have been classified as physicians in the census.

At the upper end of the age scale the census enumeration is substantially less than the AMA figure. The census tabulation shows 20,800 employed physicians aged 65 or over, about 8,200 fewer than the AMA. Since the census enumerator asked specific questions about work during the week prior to enumeration, many of the older physicians may have reported inactivity at that time although they had not designated themselves as retired in reporting for the American Medical Association Directory.

Dentists

About 75,000 persons were employed as dentists in civilian practice in April 1950, accord-

ing to the 1950 Census of Population. This is an increase of 7.5 percent during the decade 1940-49. Projection on the basis of the preliminary age distribution of employed male dentists indicates that at the time of enumeration about 8,000 of the employed dentists were under 30 years of age, 59,400 were in the age group 30-64, and 7,600 were 65 years of age or older.

Studies published by the American Dental Association indicate that there were about 87,000 living dentists in the spring of 1950. Of this number about 1,600 were in the armed forces. While reliable information on retirement is not available, limited data obtained by the American Dental Association from a surveyed sample of dentists have been published. Application of their findings to the total dentist group suggests that the retired do not number more than a few thousand and that this group, together with those serving with the armed forces, cannot account for all of the difference between the two totals.

Inspection of age distribution data from the two sources indicates that the census count exceeds by a thousand or more the number of dentists under 30 years of age for whom data were

recorded in the ADA files. This excess may reflect the inclusion of some dental students in their clinical training years. For the age span 30-64 years, the count obtained by the Bureau of the Census was several thousand less than the number included in the ADA total even after liberal adjustment is made by subtracting from the ADA total retired dentists and those serving in the armed forces. It seems likely that this under-enumeration may in part explain the excess in physician enumeration discussed previously. While the census total for dentists 65 years of age and older is smaller than the ADA figure for this group, adjustment of the latter by subtracting retired dentists brings the figure into close agreement.

Nursing Occupations

In the field of nursing, four categories of personnel are reported by the Bureau of the Census. These are graduate professional nurses, students of professional nursing, attendants in hospitals and other institutions, and practical nurses, together totaling 810,920 employed in civilian practice in April 1950.

Employed persons in selected health occupations, by sex, for the United States: 1950 and 1940

| Occupation | 1950 | | | 1940 | | |
|---|----------|----------|----------|------------------|------------------|------------------|
| | Total | Male | Female | Total | Male | Female |
| <i>Professional and technical workers</i> | | | | | | |
| Chiropractors..... | 12, 897 | 11, 061 | 1, 836 | 10, 629 | 8, 758 | 1, 871 |
| Dentists..... | 75, 176 | 73, 024 | 2, 152 | 69, 921 | 68, 874 | 1, 047 |
| Dietitians and nutritionists..... | 22, 329 | 1, 341 | 20, 988 | (¹) | (¹) | (¹) |
| Nurses, professional..... | 398, 194 | 9, 683 | 388, 511 | } 352, 486 | 7, 509 | 344, 977 |
| Nurses, student professional..... | 76, 071 | 1, 646 | 74, 425 | | | |
| Optometrists..... | 15, 476 | 13, 758 | 1, 718 | 10, 237 | 9, 762 | 475 |
| Osteopaths..... | 5, 146 | 4, 366 | 780 | 6, 007 | 4, 905 | 1, 102 |
| Pharmacists..... | 88, 087 | 80, 854 | 7, 233 | 77, 779 | 74, 563 | 3, 216 |
| Physicians and surgeons..... | 191, 947 | 180, 233 | 11, 714 | 165, 989 | 158, 381 | 7, 608 |
| Technicians, medical and dental..... | 76, 174 | 33, 053 | 43, 121 | (¹) | (¹) | (¹) |
| Therapists and healers ² | 24, 443 | 12, 347 | 12, 096 | 17, 055 | 9, 545 | 7, 510 |
| Veterinarians..... | 13, 410 | 12, 547 | 863 | 10, 717 | 10, 638 | 79 |
| <i>Other workers</i> | | | | | | |
| Attendants, hospital and other institution..... | 202, 168 | 83, 117 | 119, 051 | 93, 049 | 54, 307 | 38, 742 |
| Attendants, physician's and dentist's office..... | 40, 777 | 2, 028 | 38, 749 | 32, 309 | 1, 387 | 30, 922 |
| Opticians, and lens grinders and polishers..... | 19, 147 | 16, 643 | 2, 504 | 11, 098 | 10, 107 | 991 |
| Midwives..... | 1, 698 | 307 | 1, 391 | } 91, 107 | 3, 909 | 87, 198 |
| Practical nurses..... | 134, 487 | 5, 731 | 128, 756 | | | |

¹ Data not available. ² Not elsewhere classified.

Source: U. S. Bureau of the Census. Figures for 1950 based on preliminary summarization and subject to revision.

Graduate and student professional nurses are reported separately for the first time, but the census figure for students is far short of the enrollments in the schools of nursing as of January 1, 1950. Census information on the age distribution of those included in the professional nurse count suggests that more than 20,000 individuals reported as professional nurses may actually be students. Adjustments, on this basis and in terms of probable enrollments at the time that the census was taken, give totals of 99,700 professional student nurses and 374,600 employed professional nurses. The combined total for these two categories shows an increase of 34.5 percent over the 1940 census count.

It should be borne in mind that the figure on professional nurses includes all employed graduate nurses whether or not they are currently registered. It seems likely that some nonprofessional nursing personnel also may be included, but the meager data now available from other sources suggest that this error is relatively inconsequential.

Other Health Occupations

The census enumerations of several occupations closely allied to medicine are considerably lower than estimates of active practitioners in 1950 available from the professional associations. Some comparative figures are given below:

| | Census | Association |
|---------------------|--------|-------------|
| Chiropractors | 12,897 | 20,512 |
| Optometrists | 15,476 | 19,724 |
| Osteopaths | 5,146 | 11,155 |
| Veterinarians | 13,410 | 15,305 |

The figures from the associations include persons in the armed forces and may include some who are retired, inactive, or devoting the major part of their time to other occupations. Adjustment for these factors still shows that the census counts are substantially lower than the estimates from other sources. Further investigation of the census figures will be possible when State tabulations showing detailed characteristics become available in the spring of 1953.

Mrs. Hobby New Federal Security Administrator



Oveta Culp Hobby of Houston, Tex., took office as Federal Security Administrator on January 21, 1953. Fourth Administrator since the Agency's creation in 1939, she will supervise the operations of the Public Health Service, the Social Security Administration (including the Children's Bureau), the Food and Drug Administration, the Office of Education, the Office of Vocational Rehabilitation, Howard University, St. Elizabeths Hospital, the American Printing House for the Blind, and the Columbia Institution for the Deaf.

At the time of her appointment Mrs. Hobby was editor and publisher of the Houston Post and executive director of Station KPRC-AM-FM-TV. Prior to World War II she served as parliamentarian, Texas House of Representatives, and was on the editorial and executive staffs of the Houston Post.

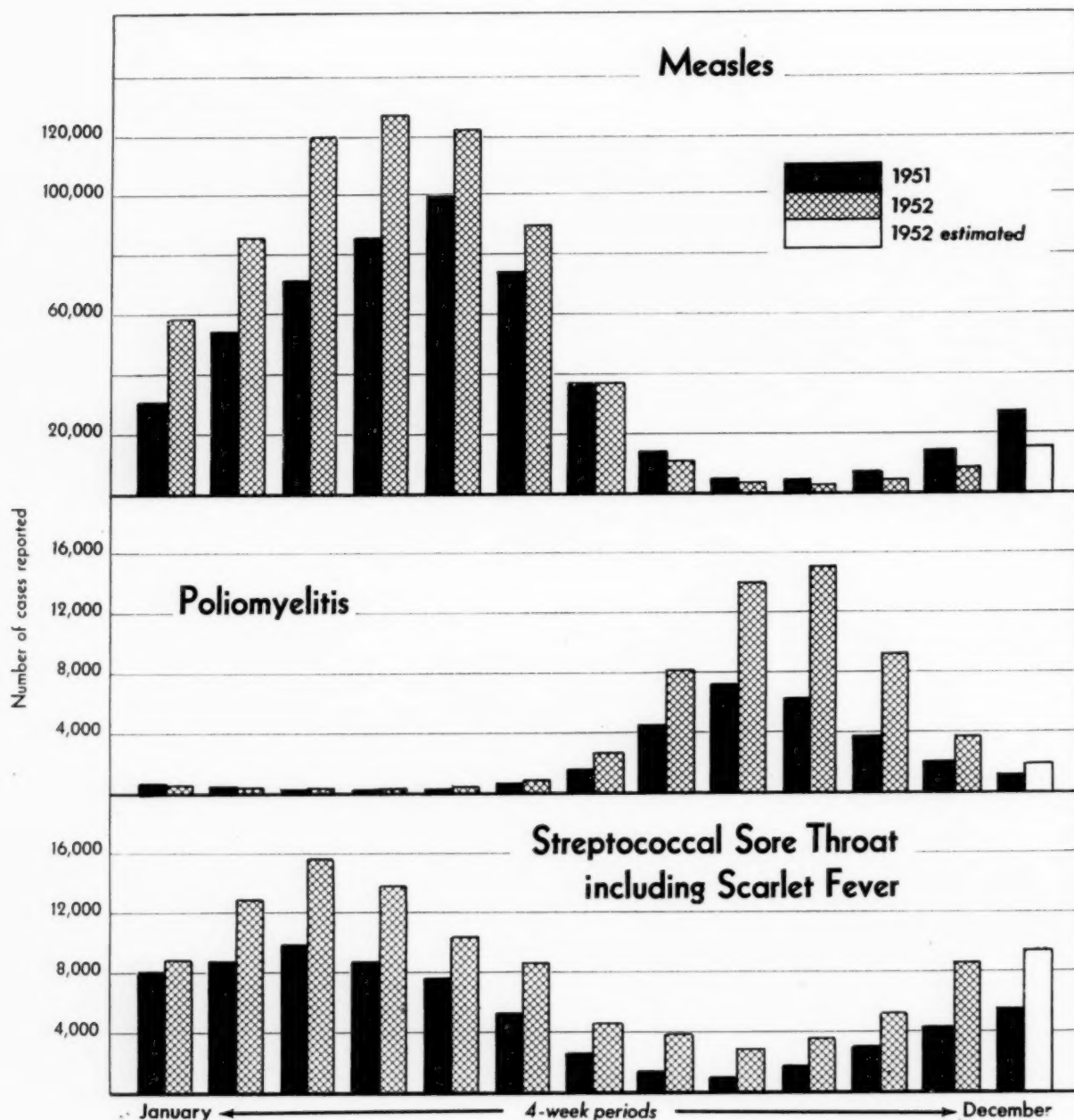
Mrs. Hobby came to Washington in 1941 as chief of the women's interest section of the War Department. When the Women's

Army Auxiliary Corps was created in 1942, she was appointed its director. She also served as director of the Women's Army Corps, with the rank of colonel, from 1943 to 1945.

The Administrator has been active in journalistic affairs, here and abroad, serving on the board of directors of the American Society of Newspaper Editors (1947-50), and as consultant-alternate to the Freedom of Information Conference at Geneva in 1948.

Mrs. Hobby has been a member of the board of directors of the National Conference of Christians and Jews. She has also been a member-at-large of the board of governors of the American National Red Cross. In 1948 she was a consultant to the Bipartisan Commission on Organization of the Executive Branch of the Government, and later became a member of the board of directors of the Citizens Committee for the Hoover Report.

National vice chairman of the 1949 American Cancer Society campaign and a member in 1950 of its national leadership committee and national advisory council, Mrs. Hobby also is a member of the board of directors of the Texas Medical Center.



Seasonal Occurrence of Communicable Diseases

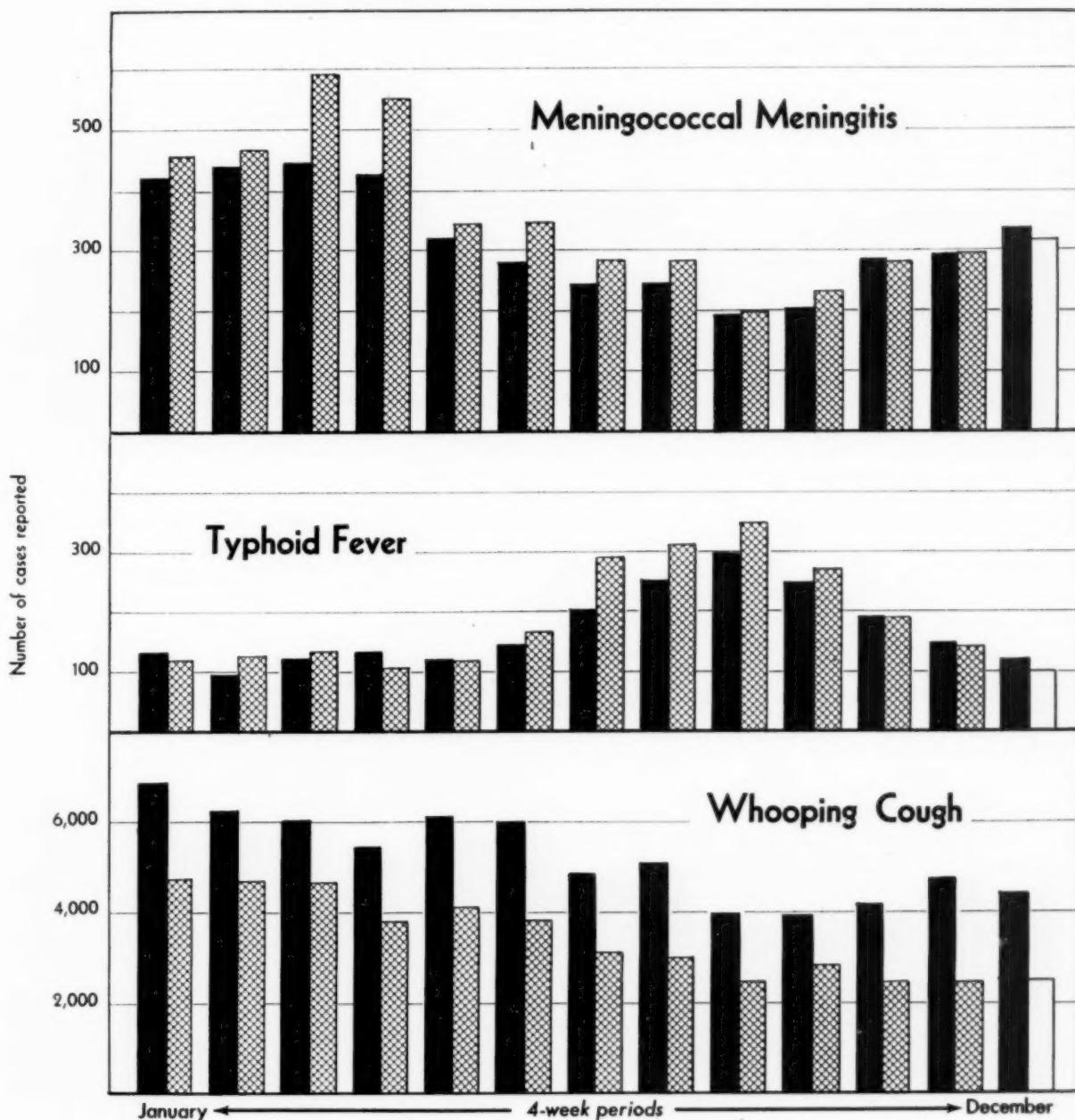
1951 and 1952 Summary

The relatively high incidence of measles and streptococcal sore throat including scarlet fever in the winter and spring months, as compared with summer and fall, is

striking. Meningococcal meningitis and whooping cough also occur more frequently in the winter and spring than in other seasons, but incidence of these dis-

eases is more evenly spread over the entire year than is measles or streptococcal sore throat.

The distribution of two "summer" diseases, typhoid fever and



poliomyelitis, is also different. Typhoid fever is spread throughout the year but has a summer peak; poliomyelitis is mainly concentrated in a few months—July, August, September, and October.

Several of the six diseases occurred in greater numbers in 1952 than in the previous year. This is particularly true for measles and

poliomyelitis. However, in the last half of 1952, incidence of measles was less than that for the same period of 1951. Streptococcal sore throat, including scarlet fever, was reported in larger numbers for each of the 4-week periods of 1952. Incidence of meningococcal meningitis was higher in the winter and spring months of

1952 than it was in 1951; in the summer months of 1952, more typhoid fever occurred than during the same period of the previous year.

This material was prepared by the National Office of Vital Statistics, Public Health Service.

Community-Wide Chest X-Ray Survey

Tuberculosis control rests primarily on the principle of preventing the spread of infection. Now that we have successfully controlled milk-borne infection, our remaining problem centers on finding every human source of infection, every person with active disease, as soon as possible. Supervision and care, the means of preventing further infection and of making the patient non-infectious, can thus be provided at the earliest possible moment.

Since a person with an unknown or hidden case of tuberculosis feels well and looks well, even to the critical observer, the only way to find him is through the screening of apparently healthy population groups—through the screening of entire communities. It is this philosophy which underlies the conduct of every community chest X-ray survey in this country and which has been the basis of radiographic activities of the Public Health Service since 1947.

The role of the Public Health Service in the planning, organizing and conducting of such mass surveys, and the problems that will be met in any community in the planning of a survey are detailed in the eight papers brought together in the publication, "Community-Wide Chest X-ray Survey." Except for the introduction by Dr. James Perkins, managing director of the National Tuberculosis Association, and the article by Dr. R. J. Anderson, chief of the Division of Chronic Disease and Tuberculosis, Public Health Service, all of these papers have appeared in the former Tuberculosis Control Issues of *Public Health Reports*.

In the past 5 years the Public Health Service has assisted 17 communities to conduct mass X-ray surveys. In this time 5,800,000 chest X-ray films (70-mm.) have been taken in a total adult population of some 8,800,000. In his paper, "Rationale and Results," Dr. Anderson

summarizes the results of these 17 surveys in terms of participation, X-ray findings, referrals, and established diagnoses. He concludes with an outline of the average experience from chest X-ray surveys.

The six papers previously published cover the survey pattern, nursing, social work, the diagnostic center, medical profession, and records and reports. Each deals with the planning and organization of various aspects of a survey, the role and responsibilities of the professions in presurvey planning as well as in follow-up services. Step by step procedures are outlined and guides for diagnostic referrals and illustrations of various record and report forms are included.

• • •

Community-Wide Chest X-Ray Survey. (Public Health Service Publication No. 222) 1952. 117 pages; illustrations, tables, charts. 30 cents.

Cancer Morbidity Series

Numbers 4 and 5 of the cancer morbidity series are concerned with cancer illness among the residents of Denver, Colo., and Pittsburgh, Pa. Patterned like the first three reports, these publications contain charts, tables, and text on the incidence, prevalence, and mortality rates; age, sex, and color differences; stage at diagnosis; survival rates; and hospitalization.

According to the two surveys, the incidence of cancer apparently increased 26 percent in Denver and 31 percent in Pittsburgh during the period 1937-47. In both cities, a much greater increase was noted among males than females. The incidence of cancer of the lung more than doubled for males and almost doubled for females. Each survey showed that the incidence rates for both men and women were highest in 1947 for the following site groups: digestive organs, genital organs, and skin.

Mortality from cancer has been in-

creasing in the United States since 1900, except for white females, for whom the cancer death rate has leveled off since 1936. In Denver, the cancer mortality rate declined 18 percent among females. Between 1939 and 1947 the greatest increase in mortality from cancer of any primary site was from cancer of the lung and bronchus among males.

These surveys give evidence that early diagnosis is closely related to chances for survival. In the Pittsburgh report, this was clearly shown by the 12-month survival rates for cancer of the uterus. When diagnosed in a localized stage, the 12-month survival rate for uterine cancer was 89 percent. When there was regional involvement, 75 percent of the women with uterine cancer survived for 1 year. This percentage dropped to 15 percent when cancer diagnosis was made after metastasis had set in.

Both reports indicate that cancer patients are receiving better medical care. More patients in the two cities received hospital care in 1947 than 10 years previously.

• • •

Cancer Illness Among Residents of Denver, Colo. Cancer Morbidity Series No. 4 (Public Health Service Publication No. 112) 1952. 39 pages; tables, charts.

Cancer Illness Among Residents of Pittsburgh, Pa. Cancer Morbidity Series No. 5 (Public Health Service Publication No. 126) 1952. 46 pages; tables, charts.

Individual copies of these publications available from the National Cancer Institute, Public Health Service, Bethesda 14, Md.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication (including its Public Health Service publication number). Single copies of most Public Health Service publications can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.



The Practice of Public Health, 1952

Cincinnati, Ohio, May 1, 1873

WE INAUGURATE today the American Public Health Association, the objects of which are "the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene." The field of labor upon which we enter is most inviting to the student of social science and to the philanthropist, for it embraces the highest interests of man and of human society. In its broadest acceptation, sanitary science aims to secure to each individual the most perfect type of the species, immunity from disease, and death from old age, or the natural decay of the structures and functions of the body. The most superficial view of our race discovers the value of a science having such aims, and the momentous task which it proposes to accomplish. On every hand we witness the most prodigal

waste of human life. Inheriting as a birthright health and longevity, we find that man lives but a moiety of his days. Of the children born, what vast percentages never see the anniversary of their birth! What other large percentage dies under 5 years! How few, comparatively, reach the age of 10! At 20 the generation has dwindled to an insignificant minority, and at 33 to 45 it disappears altogether. And even during his short and uncertain life, what physical evils cling like an inheritance to man's body, soul, and estate. . . .

As we contemplate human society in its various stages of development, from that of the savage to the most civilized, from the most ancient to the present time, sickness and death, insanity and imbecility, injustice and violence, everywhere appear as if these were the normal

See next page

a topical and selected report of the 80th annual meeting of the

AMERICAN PUBLIC HEALTH ASSOCIATION

and related organizations held at Cleveland, Ohio, October 20-24, 1952

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conditions of mankind. And even if we penetrate beneath the surface, and study the origin and progress of epidemics and endemics, of the slight causes which produce mental and moral aberrations, and of the universal greed for wealth, we can readily admit the conclusion at which the world has long since arrived, namely, that these physical evils are visitations inflicted as part of the curse of man's first disobedience. In various religious and social phrases we are accustomed to express the historical conviction of the race as to the inherent nature of man's infirmities and prematurity. But the science which we cultivate, and which this Association is organized to promote, discarding the traditions of the past and the teachings of false philosophies, interprets the laws that have been set for the guidance and control of man's earthly existence by the exact demonstrations of a true physiology. This science of life reveals to us the stupendous fact that man is born of health and longevity, that disease is abnormal, and death, except from old age, is accidental, and that both are preventable by human agencies.

In order to fully comprehend the mission of sanitary science, and its capability of benefiting our race, we should, at the outset of our organized efforts, thoroughly understand man's inherent capacity for health and long life, and the conditions which modify or vitiate them. For, if we labor as did our elder brethren in the belief that disease and death are visitations of God for violations of the moral code, our efforts will be vain, diseases will not be prevented, and death will continue to press its claims to two-thirds of man's rightful and inherited existence. . . .

We are justified, therefore, in fixing the normal period of man's earthly existence at about 100 years. This is the limitation of life fixed by the laws governing his development, growth, maintenance, and decay. This is the length of life to which every man has an in-

herent right. Every death at an age short of that period is due to unnatural or abnormal conditions. For, whatever peculiarities man may inherit from his ancestors which curtail this period, his normal development is still according to the type which gives him 100 years of life. This, therefore, is the standard of average normal longevity which we must set as the lease of life inherited by man. . . .

The outlook, from our present standpoint, of the future of sanitary reform in this country is exceedingly favorable. An agitation has evidently begun which is daily taking on larger and yet larger dimensions. State municipal boards of health are being rapidly organized in all parts of the country; the medical profession is beginning to manifest a deep interest in sanitary science as a department of study, and medical societies in all the States are earnestly discussing the various questions relating to its practical application.

In the midst of these active agencies this organization is about to take its place. Largely composed of persons actively engaged in sanitary study and administration, the Association must aid powerfully in advancing this reform, in harmonizing measures susceptible of general application, and in securing the cooperation among all our health authorities so essential to the successful resistance of invading epidemics, as well as the control or destruction of those agencies on which depends the origin or propagation of our domestic pestilences.

—STEPHEN SMITH, M.D., *president of the Association. Excerpts from "On the Limitations and Modifying Conditions of Human Longevity, the Basis of Sanitary Work," an address delivered at the opening of the first session of the American Public Health Association, Cincinnati, Ohio, May 1, 1873.*

The "terms of reference" of this news-summary report of the 1952 APHA meeting are given in Part I, which appears in the January 1953 issue of *Public Health Reports* (see editor's note, page 82).

BW Defense, General Services Of Virus Laboratories

More laboratories for the diagnosis of virus and rickettsial diseases would make possible discovery and confirmation of some of the less common infections in areas where they are not known to be endemic, as well as adding to knowledge of known organisms. Such laboratories would be of world-wide benefit to public health and of incalculable value in the event of biological warfare. These views were among points discussed at the laboratory section's review of "practical applications of virus laboratory methods." Several of the papers are summarized here.

Diagnostic Laboratories Needed for Virus Tests

"The need for the establishment of a special laboratory unit . . . for the diagnosis of viral and rickettsial diseases is quite evident," said M. Michael Sigel, Ph.D., of the Virus Diagnostic Laboratory, the Children's Hospital of Philadelphia, in his address before the Conference of State and Provincial Health Laboratory Directors. From local service to the World Health Organization, he maintained, such a program would benefit public health.

However, the virus unit should not become a screening ground for the bacteriological laboratory, Dr. Sigel continued, nor should ruling out a bacterial infection be left to the virus laboratory. "An adequate work-up of a case of septic meningitis should include tests for mumps and lymphocytic choriomeningitis, and studies on respiratory outbreaks would profit immensely from a com-

bination of efforts of the bacteriological and virological laboratories," he asserted.

New Diseases Uncovered

Not only can well-known entities such as mumps or influenza be confirmed in virus diagnostic laboratories, Dr. Sigel said, but new diseases or those previously unsuspected in a community—Q fever, rickettsialpox, eastern equine encephalomyelitis—can be uncovered, as well as significant facts of public health importance. Such laboratories help the community even more than they help the patient, he went on.

For example, routine serologic tests for viral or rickettsial infection in a patient admitted to a Philadelphia hospital with a provisional diagnosis of influenza were negative for influenza and psittacosis, but showed a progressively rising antibody titer for Q fever, the speaker reported. Q fever was at that time unknown in Pennsylvania or anywhere along the Eastern Shore. The patient was employed in a wool-processing plant, where a large number of employees had been ill with "flu" or "grippe" at the time he became ill. Epidemiological studies revealed that the illness had been Q fever, Dr. Sigel said.

Three significant facts, according to Dr. Sigel, were brought out by this case: Q fever was present where it had not been suspected; raw wool or animal hair can act as vehicles for transmission of the disease; and useful epidemiological studies can be made by using information from a single case of a disease.

Labs as Listening Posts

"Acting as listening posts" in the WHO influenza program, virus diagnostic laboratories could aid in con-

trolling this disease. By looking for animal- or insect-transmitted diseases such as Q fever, rickettsialpox and lymphocytic choriomeningitis and then finding their source, the laboratory could recommend measures of control and prevention, Dr. Sigel said.

Cooperation of the physician or health officer with the laboratory is one of the most important factors in determining the quality of diagnostic work, Dr. Sigel continued. He suggested that the physician decide if viral and rickettsial isolation would help in diagnosis (serologic tests are usually preferable); that blood be obtained as soon as possible, centrifuged, and the serum refrigerated, but not frozen unless shipment is delayed, then mailed to the laboratory. If centrifugation is impossible, the clotted blood should be mailed at once; delay or freezing will cause hemolysis.

State virus diagnostic units could be helpful, the speaker felt, in controlling diseases such as psittacosis, which the Virus Diagnostic Laboratory of the University of Pennsylvania has found to be increasing in incidence during the last few months.

It would be difficult and not always desirable to have a virus diagnostic laboratory in every hospital, Dr. Sigel said, but it is felt that public health would receive great benefit if every large city or, if possible, every State should set up such a laboratory, since "the distance between the patient and the laboratory determines in very large measure just how much the laboratory can do for the community or the State." (See table, pp. 200-201.)

Virus Disease Studies Vital to Defense

The possibility of bacteriological warfare was cited as the urgent need for laboratory methods and procedures to interpret the viral and rickettsial diseases by Harry B. Harding, M.D., Opal E. Hepler, M.D.,

Nathalie Schmidt, M.S., and Edna Murmann, M.S., from the departments of bacteriology and pathology of the Northwestern University Medical School, Chicago, Ill.

Reporting on results shown by a 2-year study of viral complement fixation tests on serums of hospital and clinic patients, they made the following observations:

Many problems must be solved before these methods become completely reliable. Obstacles included the low yield of positive results, the relative difficulty in interpreting virus tests, and the cost of performing them.

Antigen Control Important

The antigens offered are useful to the average laboratory, but since they are prepared as tissue suspensions, and are not pure virus, they are subject to variation. Therefore, tests in which these antigens are used must be carefully controlled.

Serums from clinic patients symptomatically free of acute viral and rickettsial diseases were first tested routinely with complement fixation techniques against the antigens: lymphogranuloma venereum; psittacosis; influenzas A, B, and FM 1; mumps; eastern equine, western equine, St. Louis, and Japanese B encephalitis; rickettsialpox; spotted fever; Q fever; typhus; rabies; screen spotted fever; and screen typhus.

Of the 275 specimens tested for the lymphogranuloma venereum antigen, 18 gave a positive fixation in a titer of 1:2, and only 1 serum fixed complement in a titer of 1:1,024 with this antigen. Medical histories revealed data showing the relation of the history of illness to the type of antibody found in the specimen taken from each patient. Only two patients gave a history of previous illness (one recent, one past infection).

Hospital Patients Tested

After 9 months' experience with the clinic serums, the tests on serums from acutely ill, febrile hospital pa-

tients were begun. Of the hospital serums, 250 were examined against all the antigens listed above except rabies. Additional serums were examined against lymphogranuloma venereum, Q fever, typhus, spotted fever group antigen, and typhus group antigen. Five serums were examined for rabies antibodies. The first test acute phase specimen was stored in the icebox until the convalescent phase specimen was received, and the two specimens were tested simultaneously against identical antigen dilutions and the hemolytic system on the same day.

Virus Infection Confirmed

Of the results obtained from 4,365 separated viral complement fixation tests on the serums of hospital patients acutely ill at the time the first specimen was examined, those from 14 patients yielded results interpreted subsequently as giving positive confirmatory evidence of virus infection. Of these, seven reacted to mumps virus antigen, two to the antigen of lymphogranuloma venereum, three to the psittacosis virus antigen, and two to the antigens of influenza viruses. Attention was directed to a case of meningitis re-

Tests for viral diseases

| Disease | Recommended tests | Material needed |
|---|--|---|
| Influenza----- | 1. Complement fixation.. 2. Hemagglutination inhibition. 3. Virus isolation in establishing etiology of outbreak. | Serum. ¹ Throat washing. ² |
| Primary atypical pneumonia (including psittacosis, Q fever, and influenza). | 1. Complement fixation with antigens of psittacosis-lymphogranuloma venereum, Q fever, and influenza. 2. Cold agglutination. | Serum. ¹ |
| Epidemic encephalitis. | 1. Neutralization. 2. Complement fixation with St. Louis and equine encephalitis antigens. 3. Virus isolation (if infection terminates fatally). | Serum. ¹ Brain. ² |
| Meningoencephalitis. | 1. Complement fixation with lymphocytic choriomeningitis, mumps, lymphogranuloma venereum. | Serum. ¹ |
| Rocky Mountain spotted fever. | 1. Complement fixation.. 2. Weil-Felix. | Serum. ¹ |
| Rickettsialpox----- | 1. Complement fixation.. | Serum. ¹ |
| Q fever----- | 1. Complement fixation.. | Serum. ¹ |

See footnotes at end of table.

ported as due to the virus of lymphogranuloma venereum.

In both the clinic and hospital groups positive titer responses to lymphogranuloma venereum, psittacosis, the influenzas, and mumps antigens were far greater than for the other antigens represented in the study. The only instances in which positive serologic diagnoses were made were for this same series of diseases.

No serologic diagnosis of an arthropod-borne encephalitis was made, nor was a diagnosis forthcoming for any disease caused by the classical rickettsiae.

Army Medical Laboratory Tests Influenza Virus

Studies at the First Army Area Medical Laboratory in New York City indicate that the same serums tested for viral influenza infections suggest greater sensitivity of antibody rise by complement fixation than by hemagglutination inhibition.

The findings were based on results of examination by complement fixation and hemagglutination inhibition of 761 pairs of acute and convalescent serums against the 1940 influenza virus strain B (Lee), reported

by Lt. Col. Andrew Fodor, MSC, and Lt. Col. James L. Hansen, MC.

Obstacles Encountered

Describing the procedures and materials used in their investigation, they reported that an obstacle encountered during the study was the development of erythrocyte agglutinating factors in the serums submitted for examination. These agglutinins were detected in virus-free controls and were usually associated with bacterial and fungal growths which developed in spite of refrigerated storage of the serums. Titrations were rendered unreadable particularly when these agglutination titers extended beyond the virus agglutination-inhibiting capacity of the serum. The difference in sensitivity may be based on the measurement of different antigenic factors, the investigators felt.

Further studies to establish the significance of these observations with a B virus strain isolated during this period are in progress, the officers said.

Texas "Flu" Epidemic Virus Identified

Identification of influenza type B in the 1945 epidemic in Texas and type A' during the 1947 and 1951 influenza outbreaks follows the observations for other parts of the country. The report of the laboratory tests in Texas was made by J. V. Irons, Sc.D., director of laboratories, and Thelma D. Sullivan, M.S., and Margaret N. Norris, B.S., virologists of the Texas State Department of Health.

The laboratory found serologic tests more rewarding in the identification of influenza types than attempts to isolate the etiological agent. Hemagglutination inhibition tests were made on paired serums from typical cases. However, A' virus was recovered from throat washings of two typical cases during the 1951 epidemic.

Tests for viral diseases—Continued

| Disease | Recommended tests | Material needed |
|--|---|---|
| Mumps----- | 1. Complement fixation-- | Serum. |
| Viral keratoconjunctivitis and conjunctivitis. | 1. Neutralization with epidemic keratoconjunctivitis and Newcastle disease virus. | Serum. ¹ |
| | 2. Virus isolation----- | Conjunctival washings. ² |
| Inclusion blennorrhea. | 1. Microscopic examination. | Conjunctival scraping. |
| Stomatitis or generalized vesicular eruptions. | 1. Microscopic examination for inclusion bodies. | Scraping or biopsy. |
| | 2. Isolation of virus----- | Vesicular fluid or mouth swab. ³ |
| | 3. Neutralization----- | Serum. ¹ |
| Lymphogranuloma venereum. | 1. Complement fixation-- | Serum. ¹ |
| Typhus----- | 1. Complement fixation-- | Serum. ¹ |
| | 2. Agglutination with epidemic and murine rickettsiae. | |
| | 3. Weil-Felix. ³ | |

¹ Usually two serums are needed; one taken early in the acute phase of illness, the other 12 to 16 days after onset; may be mailed in liquid condition.

² Should be frozen with dry ice and delivered frozen.

³ Useful in presumptive diagnosis of rickettsial infections and helpful in differentiating between Rocky Mountain spotted fever and rickettsialpox.

—From paper by M. Michael Sigel, Ph.D., Philadelphia.

A Century of Progress in Sanitary Engineering

No longer is the sanitary engineer considered merely a civil engineer specializing in sanitation. With the increased recognition of environment as an important factor influencing health, and the changes for the better that the sanitary engineer can achieve in that environment, his role has expanded to the point where he now is constantly attaining greater professional maturity, according to the speakers addressing a joint session of the APHA engineering section and the Ohio Association of Sanitarians.

Public Health "Giants" Of 1890-1910 Acclaimed

Prior to 1890, practically nothing of the actual scientific fundamentals of sanitary science was known, while by 1910, the basic principles of that science had been well and truly established, declared C.-E. A. Winslow, Dr.P.H., editor of the *American Journal of Public Health* and professor emeritus of public health at Yale University.

For more than half that period, Dr. Winslow was a student and instructor at the Massachusetts Institute of Technology. In retrospect, he views those decades in Boston as "one of the most remarkable periods in the history of public health," and he feels that the men he knew had "attributes of real greatness."

"The notable advances of the time were, of course, made possible by the application of the new science of bacteriology," he said. "They were actually effectuated through a peculiarly intimate relationship between the Massachusetts State Board of

Health and a remarkable group of pioneers on the Technology faculty."

Faculty and Officials

"William T. Sedgwick, head of the department of biology, was operating what was, in essence, the first school of public health in the world," Dr. Winslow declared. "Thomas M. Drown was establishing the basis of sanitary chemistry. . . . In 1886, the Lawrence experiment station was set up under the guidance of Sedgwick and Drown. In the 16-foot cypress tanks on the banks of the Merrimac River, the basic principles of the oxidative purification of sewage were first developed; and the Lawrence city filters, in 1883, provided the first scientifically controlled demonstration of water purification. Sedgwick and J. H. Batchelder initiated work on milk bacteriology and began the long battle for pasteurization in 1892. . . . In the Annual Report of the State Board of Health for 1892, Sedgwick presented studies on typhoid fever epidemics . . . which were classics in the field."

On the public health side of this relationship between a State and a university, Dr. Winslow noted Henry P. Wolcott, president of the board of health; Charles Harrington, secretary of the board; and Samuel H. Durgin, health officer of Boston. He named Hiram F. Mills as perhaps the greatest figure in engineering.

Among his more intimate associates, he acclaimed George W. Fuller, who "was responsible for notable pioneer studies of water purification at Louisville and Cincinnati" and who "more than any other one person was responsible for the development of the 'Standard Methods of Water Analysis' of the APHA"; Allen Hazen, who "assisted Hiram F. Mills in preparing the plans for the

Lawrence filter . . . developed the procedures for the mechanical analysis of sand, in use to this day . . . and planned the sewage disposal system for the Chicago Exposition in 1893"; and George Whipple, a member of the triumvirate, with Sedgwick and Milton J. Rosenau, which established the Harvard-Technology School for Health Officers in 1913, and author of "Microscopy of Drinking Water," still the standard work in that field.

Epidemiologist and Teacher

But the "inspiring center of the new movement was William Thompson Sedgwick," Dr. Winslow stated. Not a laboratory investigator, he nevertheless fully realized the importance of basic scientific study. "It was primarily due to his leadership that the laboratories at MIT pioneered in the application of the new tools of science to water treatment and sewage treatment, to the bacteriology of water and milk, of ice and air and food," he noted.

"In epidemiology, Sedgwick played a more direct and personal role . . . was indeed the first scientific American epidemiologist . . . the first to study the phenomena of epidemic prevalence by quantitative methods." He also, according to Dr. Winslow, was "a pioneer in the task of interpreting the possibilities of the budding science of public health to the public . . . a crusader in a new and inspiring cause."

"Most important of all, Sedgwick was an inspired and inspiring teacher," he said. The qualities which made him so, Dr. Winslow explained, were, first, "an almost passionate interest in exactitude as to words and the realities for which words stand and the relationships of words and facts in a universe which was always a connected and significant whole," and second, "his automatic assumption that the basic aim of the individual life was service to the common cause of human progress."

Dr. Winslow concluded that Sedgwick may truly be called a "giant." "I think, however, that he would

have wished me to point out that he did not create his attitude toward life out of whole cloth," he added. "Giants stand on the shoulders of giants. Sedgwick was the inheritor of a great tradition—the tradition of the late Victorians—. . . to which he gave new life and which may still lead us out of the confusions of a changing world . . ."

Claims Sanitary Engineering Deserves New Status

The ever broadening scope of sanitary engineering activities demands a break from the traditional concept of sanitary engineering as merely a branch of civil engineering, declared Earle B. Phelps, B.S., and John E. Kiker, Jr., M.C.E., lecturer and professor, respectively, of the University of Florida's College of Engineering.

"Hippocrates, Pasteur, Chadwick, Shattuck, Sedgwick, and all the others whom we claim as illustrious ancestors in sanitary science are distinguished by their innovations and departures from the traditional," they said.

Modern sanitary engineering began with the discoveries of the water-borne characteristics of enteric diseases which, in turn, led to studies of possible preventive measures, they continued. But in recent years the responsibilities of the sanitary engineer have so expanded that he now must cope also with problems of stream and atmospheric pollution, milk and shellfish sanitation, industrial and school hygiene (including ventilation and lighting), rodent control, restaurant sanitation, and many others.

The term "public health engineering" was coined to emphasize this broadened concept of sanitary engineering as a field embracing all aspects of environmental sanitation in contrast to the earlier, more narrow concept, they said.

They concluded that training in basic engineering subjects obviously is essential, but if sanitary engineer-

ing is to achieve maturity as a unified science such courses as bacteriology, parasitology, and (quantitative analysis) chemistry also must be included in undergraduate curriculums.

Environmental Conditions Cause Fifth of Deaths

An estimated one-fifth of all deaths in the world are due to environmental conditions such as unsanitary water supplies, and lack of effective control of flies and insects, of cholera, and of bilharziasis, stated Herbert M. Bosch, M.P.H., professor of public health, Engineering School of Public Health, University of Minnesota.

"The rise of the United States to a position of world leadership has made it mandatory that Americans think of global health problems. . . . World leadership has brought with it a responsibility for world health," he asserted.

The solution of the sanitation problems in any country will be one which fully utilizes local labor and material and which does not deviate too widely from the local cultural patterns. American sanitation methods may not be satisfactory in a foreign country, he pointed out.

Safe Water a Problem

For example, he noted, it would be economically impossible to supply enough hand pumps and well casing for all the small villages in Africa and Asia. Supplying safe water for such small villages is thus still a problem. In many parts of the world, he continued, human excreta is used for fertilizer, and no method for such use has been developed which satisfies both the sanitary engineer and the peasant.

The continued success of sanitation programs in any country depends on a core of nationals competent in public health engineering, he said. Urging establishment of training centers in other countries, Mr. Bosch felt more benefit would

be gained by giving training in regions nearer environmental conditions native to the trainees.

On the question of whether service in foreign countries is a satisfying professional experience, Mr. Bosch said: "Many . . . derive satisfaction from being able to do work which has such measurable results. Those who have been most successful are men who are willing to learn from a country as well as to teach, who like to work with people, who do not have a feeling of superiority, and who attempt to understand and appreciate the culture of the country in which they are working."

To Solve Modern Problems Teamwork Is Required

Engineers in public health cannot rest on the laurels of their past performances, since tremendous responsibilities lie ahead in many of the underprivileged areas of the world and an untold amount of work confronts them in many parts of this country, asserted Rolf Eliassen, Sc.D., professor of sanitary engineering at Massachusetts Institute of Technology, in a talk on environmental health for the next century.

Throughout his presentation Dr. Eliassen called for "unsurpassed" cooperation between engineers and other scientists in public health. Almost every modern problem, he said, calls for teamwork with a different set of public health scientists.

Waste Disposal

Refuse disposal is a major engineering problem in most cities. It has been estimated that 8,000 communities need modern refuse disposal facilities in this country alone, not to mention those communities which need modernization of sanitary equipment and methods, he reported.

Sewage and industrial waste treatment plants should be improved. We need faster acting, smaller, and cheaper treatment plants in order to promote water pollution abatement, he said.

Agriculturalists all over the world are clamoring for more organic fertilizers and humus material to build the soil and maintain high productivity, Dr. Eliassen commented.

More economical and more readily applied methods of insect control are needed, he noted.

Food Sanitation

Food sanitation, although quite well developed, "stares us in the face" when reliable sources estimate that there are about 1,000,000 food poisoning cases a year, he said. Although dishwashing has been advanced by engineering, the methods of desoiling and storage of dishes could be improved to keep the dishes sanitary, he noted as an example.

Housing

The hygiene of housing is a tremendous task facing the profession. Home accidents, a major source of disability and mortality, must be fought as well. Leadership for the enactment and enforcement of rational housing standards, for the construction of new housing, for rehabilitation of substandard housing, and for adequate maintenance of approved housing must be furnished, according to Dr. Eliassen.

Air pollution is a problem demanding much research by allied scientists, he reported. Problems now unknown will also face the profession in the future.

Simple and inexpensive means of securing good water for the underprivileged areas of the world should be developed, Dr. Eliassen concluded.

Urges Engineer's Study Environmental Stress

Since the primary concern of sanitary engineering is the control of environmental stresses upon man to maintain health and well-being, its principal objective, in the opinion of Theodore Hatch, M.S., is to anticipate and prevent excessive environ-

mental problems rather than to correct bad situations after they have developed.

Mr. Hatch, who is with the University of Pittsburgh's Graduate School of Public Health and the Mellon Institute's Industrial Hygiene Foundation, said that sanitary engineers must develop a deep understanding of man-environmental relationships—a knowledge of human response to environmental stress which can be translated into engineering terms and wedded with basic engineering knowledge and skills. He felt that such knowledge permits human factors to be dealt with in engineering analysis and design on a par with physical laws which govern ordinary engineering practice.

But human behavior is complex and cannot be reduced completely to equations, Mr. Hatch continued. The sanitary engineer must distinguish between emotionally evalu-

ated and descriptively handled behavior aspects and the man-environmental relationships which meet engineering criteria. Nor can he work independently, said Mr. Hatch. The translation of laws of human response to environmental stress into engineering terms for regular use in analysis and design requires the participation of biological and medical scientists as well as sanitary engineers, and the field is therefore an overlapping one that must be developed and shared equally by the two groups.

There is still a need for engineering skills in the control of infectious diseases, and the need will continue until adequate sanitation is provided for all the people, he said.

But "the need in new areas for joint research and close collaboration of engineers and other physical scientists with biological and medical scientists is even greater," he emphasized.

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Epidemiological and Control Aspects of Anthrax

The 1951-52 outbreaks of anthrax in animals were reviewed in epidemiological and preventive terms during sessions of the Conference of Public Health Veterinarians and the APHA engineering, epidemiology, food and nutrition, and laboratory sections. Reports were presented on bonemeal as the source of infection in Ohio swine, on the control problems, and on economic effects. An increase of human anthrax of industrial origin was also noted.

CDC Veterinarian Outlines Anthrax Control Measures

Numerous outbreaks of animal anthrax in the United States during 1951-52 were traced to contaminated bonemeal, said James H. Steele, D.V.M., M.P.H., chief, veterinary public health services, Communicable Disease Center, Public Health Service.

Most cases occurred in Ohio, Indiana, and other midwestern States, he noted. Michigan reported its first case since 1916. None of the States were considered anthrax enzootic areas, he said.

Anthrax was prevalent in cattle, horses, sheep, and mink, but most outbreaks were among swine. Nearly all the diseased hogs were pregnant or nursing sows on a high protein-calcium ration, he said.

No human cases were attributed to any of the swine outbreaks, Dr. Steele stated.

Control Measures

The U. S. Department of Agriculture now prohibits importation of

raw bonemeal. It also requires that any bonemeal brought into the country be sterilized at 250° F. under 20 pounds' pressure. Many States have similar regulations, Dr. Steele reported. In the Ohio outbreak, he observed, penicillin or other antibiotics were preferred to immunizing agents in controlling anthrax in swine. But in treating cattle, penicillin is not recommended in place of vaccination because relapses have followed injection, he said. He pointed out that aureomycin and terramycin were successful, however.

Even though anthrax is not readily transmitted to man, control measures for handling milk from infected premises, for processing meat animals from known infected farms, and for preventing occupational disease among animal handlers are needed to remove any threat to public health, Dr. Steele stated.

Prevention of occupational anthrax can best be answered by health education, he concluded. Meat animals from infected farms should be processed in abattoirs or packing plants under Federal or local inspection services, he said.

Quarantine of the premises does not always answer the problem of handling milk from a farm where anthrax has infected a milking herd or other animals, he said. Unduly stringent quarantine regulations may discourage reporting of the disease and cause economic loss for the dairyman, he warned.

"I have had the opportunity to see some sizable nuisance problems develop when the milk from 500 or 600 cows is dumped on a farm in a warm climate," he observed.

Proposed Dairy Control

Dr. Steele read proposed Public Health Service recommendations for controlling anthrax in milk herds.

Presented a week in advance of discussion at the Louisville convention of the U. S. Livestock Sanitary Association, the rules were drafted with assistance from the U. S. Bureau of Animal Industry, the Federal Food and Drug Administration, the Federal Civil Defense Administration, the American Veterinary Medical Association, and the U. S. Livestock Sanitary Association. They stipulated that:

No milk be sold from suspected animals until a licensed veterinarian declares them anthrax-free; animals with temperatures of 103° F. or other signs of the disease be isolated from the milking herd; milking utensils be sterilized for 30 minutes after exposure to contamination; and dairy barns be thoroughly cleansed by washing and treatment with a 5-percent lye solution for 2 hours after discovery of the disease.

The regulations call for reporting of cases to the local health officer and veterinarian, control of the disease by the local health department and State livestock sanitary officials, and close cooperation between the milk and livestock disease control authorities.

Economic Losses Result From Anthrax Outbreak

The 1952 outbreak of anthrax in Ohio affected the economics of many phases of the Ohio livestock industry, according to the report presented by James R. Hay, D.V.M., chief of the division of animal industry, Ohio Department of Agriculture.

Although the loss incurred by deaths of affected animals (brood sows) was not significantly high, averaging 1½ animals on each of the 287 affected farms, the outbreak had detrimental effects upon such economic factors as swine feeding practices, the sale of swine, interstate movements of all livestock, and even the sale of milk, he said.

The major loss suffered by the swine industry resulted from the

changes in feeding practices, Dr. Hay believes. The knowledge that contaminated raw bonemeal had caused the outbreak led many breeders and feeders to discontinue the use of mineral feeds, despite the fact that the manufacturer of the contaminated product had recalled all unused portions.

Many breeders also ceased purchasing commercial supplements because they contained bonemeal or animal protein, he reported. Vegetable proteins were frequently substituted for animal protein. Moreover, in some instances feeders wasted money by increasing the antibiotic in the feeds over the known "growth factor" level.

Many packers and processors refused to purchase swine from any farm located in a county where anthrax had been diagnosed, Dr. Hay also pointed out. This in turn precipitated fear in the minds of some producers, who sold their swine for slaughter before they had reached ideal market weight.

Further economic losses undoubtedly resulted from outbreaks of hog cholera during the summer of 1952, some of which may be attributed to the fact that farmers did not have their swine vaccinated during the anthrax period, Dr. Hay indicated.

The occurrence of anthrax also affected milk producers since in some

instances milk from dairy farms having affected swine was rejected. Some local sanitary boards refused to permit the flow of milk into regular channels from quarantined farms regardless of sanitation, management, and isolation practices.

However, the outbreak stimulated a desire for an efficient state-wide meat inspection program. "The use of sterilized used feed bags will have a far-reaching effect in minimizing the spread of many livestock diseases," he concluded. "The new Federal regulations governing international shipment of animal feed-stuffs will likewise provide security."

Epidemiology of Anthrax in the United States

Human anthrax of industrial origin has increased in the United States during the past decade, especially in the New England and Middle Atlantic States, Arthur H. Wolff, D.V.M., of the radiological health training section, Environmental Health Center, Cincinnati, reported.

The infective agents, he said, are imported goat hair, goat skins, and carpet wool from Asia, North Africa, and possibly southern Europe. Although there has been an increase in reported cases in man, the annual

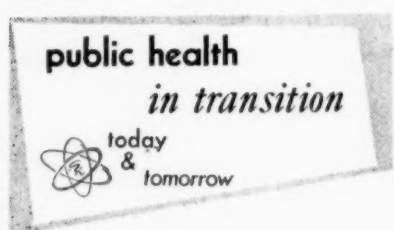
average has been less than 70 cases during the past 11 years, 75 percent of which were industrial in nature and were attributed to animal materials. Since the introduction of penicillin therapy, few or no deaths from cutaneous anthrax have been reported when diagnosis and treatment were reasonably early.

Worst Anthrax Outbreak From Imported Bonemeal

Anthrax spores imported in 1952 in raw bonemeal were the cause for the most severe anthrax outbreak in swine on record in Ohio, according to H. G. Geyer, D.V.M., and H. E. Goldstein, D.V.M., former chief and field investigator, respectively, of the division of animal industry, State Department of Agriculture.

The sporadic outbreaks of 1916, 1923, and 1951 had involved only one or two farms in the State, but the 1952 epidemic spread into many counties, they reported. However, there was a loss of only 384 hogs from 264 farms, and the disease did not appear to spread to other animals.

Prompt reporting by veterinarians, adequate quarantine, and early administration of penicillin and anti-anthrax serum were the control measures which brought success to the program, they stated.



This past half century has witnessed an evolution in traditional public health activities. The task of basic sanitation continues, but takes on new dimensions. We move against communicable disease not in terms of containment, but of prevention—in some cases, of eradication. Today's laboratory is essential to epidemiology, diagnosis, treatment—and itself

breaks new paths in research. In shaping our course of action we rely upon data acquired through the nation-wide cooperative system of vital records and health statistics—another product of these 50 fruitful years.

Meantime, new concepts, new programs, have come into being. Even a partial listing of areas of public health practice of common acceptance today would include . . .

Community health education . . . professional training . . . tuberculosis and venereal disease control . . . school health . . . nutrition . . . malaria and insect vector control . . . public health nursing . . . water pollution control . . . occupational health . . . diabetes

control . . . mental hygiene . . . cancer services . . . epidemiological, administrative, social, clinical research . . . medical care . . . dental programs . . . maternal and child health services . . . housing and health . . . rodent control . . . radiation protection . . . heart disease control . . . multiple screening . . . hospital planning and construction . . . rehabilitation . . . blood programs . . . accident prevention . . . civil defense.

Today's public health programs have emerged in response to recognized needs. Action has come with advances in the biological, physical, and social sciences. The pictures following highlight some of these current and developing fields of local, State, and Federal health services. ▶

Policies for the Promotion Of Healthful School Life

A joint session of the APHA sections on maternal and child health, public health education, public health nursing, school health, and health officers with the American School Health Association sought to bring up to date developments in the field of school health policies. Among topics discussed in light of the forthcoming revision of the standard reference under this title were: promoting healthful living in schools, health and safety education, services for health protection and improvement, health aspects of physical education, and school responsibilities for the education and care of handicapped children.

Outlines Major Revision In School Health Policy

Redirecting school health education would clarify current school health policies, Helen M. Starr, Ph.D., director of health, physical education, and recreation for Minneapolis Public Schools, declared.

"We are not carrying out the recommendations of the present report," she said, referring to current APHA policy carry-over to present health education. Many schools are teaching health rather than helping boys and girls live healthfully through sound instruction, she said.

"Why not tie in the aspects of health service and healthful school

living with the program of health and safety education in revising current policies?" Dr. Starr asked. Listing the services and living activities which are a regular part of the health curriculum would contribute to program integration, she said.

Dr. Starr appealed for major policy restatements on the objective of health education, coordination of the program and integration of its various parts, organization of the health course, introduction of a health program into the schools, and more specific standards of guiding the program.

Instruction Objectives

Primarily, a policy revision should state the understanding, attitudes, and skills to be achieved by health education in a complete curriculum, Dr. Starr said. Its formulation would serve to determine the content of health courses, the needed school and community health services, and later to evaluate the effectiveness of health teaching, she

believes. As examples of understanding, she listed:

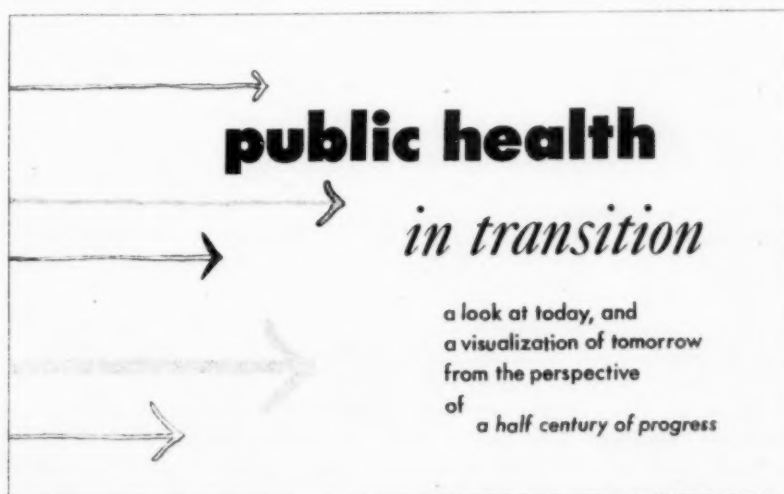
Good health is a state of complete physical, mental, emotional, and social well-being, not merely the absence of disease. Individuals differ in their rate of growth and in their capacities. Their acceptance of this difference is necessary to good mental health. Complete medical, dental, and psychiatric services are available for improving health.

Desirable attitudes, she said, are appreciation of preventive medicine and public health education programs, cooperation in maintaining high health standards in the home, school, and community, and acceptance of one's strengths and limitations.

Suggested health teaching areas to be included at each level of the school experience are these, she said: human growth and development; health maintenance and improvement; dental health; nutrition, rest, relaxation, and exercise; personal appearance, mental health, and personality development; home and family living; alcohol; narcotics and drugs; safety education including civil defense and disaster education; and public health.

"The health course should carry the same recognition in regard to credit and requirements as other basic courses," she said.

This album material (and last month's) is adapted from the Public Health Service exhibit at the 1952 APHA meeting.



Capacities Only Limit For Handicapped Child

Handicapped children should be helped to participate in activities with normal children to the extent of their capabilities, declared Arthur J. Lesser, M.D., director of the Division of Health Services of the Children's Bureau, Federal Security Agency.

The physical, intellectual, social, and emotional needs of crippled children are basically the same as those of other children, he said. Although they may find the problems of growing up accentuated because of their handicaps, they can best face the rest of the world if they learn to do so from early childhood.

"With our help," he continued, "they can develop to the extent of their physical and mental capacities and most of them can become independent contributing members of society." He said this requires a well-planned community health and education program that includes case finding, diagnostic and treatment services, social services, education (including special education), and vocational counseling.

For children too handicapped for education in regular classes, Dr. Lesser continued, special classes are becoming increasingly common. However, too few schools now have such programs since provision for educating orthopedically handicapped children, for example, should include: transportation by bus with an attendant or by taxi, ramps and elevators, close medical supervision by pediatricians and orthopedists, physical and occupational therapy, hot lunches, specially trained teachers and other personnel, and rest facilities.

Problems Differ

The best type of school situation for the handicapped child must be determined by each individual's requirements, Dr. Lesser stressed. Some children may be so handicapped that they are unable to attend regular or special classes and there-

fore must be educated in special schools, hospitals or their homes. Also, he said, orthopedically handicapped children may present different educational problems than, for instance, those with cerebral palsy, epilepsy, or hearing difficulties.

Some handicapped children, particularly epileptics, are excluded from or are unhappy in school because of social stigmas attached to their disorders, said the doctor. He felt that they should not be excluded and that the other children's reaction toward the handicapped child will mainly reflect the attitude of the teacher.

In fact, he concluded, handicapped children should begin their formal education much earlier than normal children. When children have serious neuromuscular or hearing handicaps, he said, the preschool years become particularly important for their growth and development. He felt that although only a start has been made, the nursery school movement for the handicapped gradually is becoming more influential.

Schools Should Blueprint Plans for Health Action

Formulation of a well-publicized written plan assuring uniformity of intelligent action in emergencies, protection of children against neglect, and prevention of communicable disease will act to reduce unjustified criticism of schools, Carl A. Wilzbach, M.D., commissioner of health, Cincinnati, said in discussing school health protection and improvement.

School personnel, with aid of local medical societies, should draw up such blueprints to solve problems such as the safe transfer of responsibility to parents or other persons when emergencies occur and the treatment of children injured or taken ill when parents cannot be reached, he said.

Accidents and illnesses are bound to occur in schools, and a program of action including teacher training in

first aid procedures will prevent further injury and assure the family that needed medical services are obtained as promptly as possible.

Dr. Wilzbach outlined the need for keeping files of names, home and business addresses and telephone numbers of parents and neighbors, and a current active system of accident reporting. He also stated that schools have a direct responsibility in the prevention and control of communicable disease, and should establish cordial working relationships between schools and health departments and local medical societies. He advocated the services of a medical adviser for every school.

During the school years, Dr. Wilzbach urged that students should have a minimum of four medical examinations; one at the time of entrance, one in the intermediate grades, one at the beginning of adolescence, and one before leaving school. He also stressed the importance of referral of examinations to doctors selected by the students' parents.

The speaker felt that community resources should be made available to meet the health needs of school children, particularly specialized medical consultation of a diagnostic nature.

Broader Health Course Advised for Teachers

Use of a physician's services in a school's physical education program and better preparation in the biological sciences for physical education teachers were stressed by Herbert F. Walker, Ph.D., professor of health education, Columbia University Teachers College, in a discussion of practices and policies that create a healthful climate for athletics and physical activities.

The general requirement that all school pupils take part in the physical education program presents potential health problems, he said. Individuals vary widely in their capacity to perform muscular ac-

tivity. A physician is needed to classify the pupils according to physical fitness.

In the interest of pupil adjustment, Dr. Walker said, it is usually recommended that the pupil be kept on the class roster and given academic credit for the things he can do.

In addition to the customary medical services in interscholastic athletics, Dr. Walker suggested a closer identification of the medical staff with administrative decisions that relate to health, such as the length of the playing season or the practice sessions.

Dr. Walker found the present requirement of teacher certification for athletic coaches a far cry from the practice of accepting volunteered services of a former athlete to coach the school team. He also indicated progress in specifying course work.

But additional emphasis, he stated, could well be placed on public health problems, human growth and development, and health counseling in the preparation of the physical education teacher.

"School Health Policies," Revision in Preparation

"Suggested School Health Policies" is to be revised for the second time, Charles C. Wilson, M.D., professor of education and public health, department of public health, Yale University, announced.

This booklet, prepared by a committee of the maternal and child health section with advice from other APHA sections and several national organizations concerned with school health, was first published in 1940 and revised in 1945, Dr. Wilson noted. It is designed "to provide a clear, comprehensive, printed statement of the consensus of well-informed professional opinion concerning many specific school policies which directly or indirectly affect the health of children and adults," he said.

The Scope and Characteristics Of Occupational Health

The scope and characteristics of occupational health programs are undergoing modifications in keeping with new industrial processes and changing concepts of industrial-community relations, health officers and industrial hygienists were told at the APHA.

Air Pollution, Isotopes Concern Health Units

Air pollution and the use of many new chemicals and radioactive isotopes in industry and medicine are among the challenging problems facing the local health officer in the often neglected field of industrial hygiene, according to Huntington Williams, M.D., commissioner of health of Baltimore.

Dr. Williams traced the 30-year history of Baltimore's efforts in the field. Revision of the State's workmen's compensation law gave the State and city health departments responsibility for controlling and

preventing occupational diseases and permitted them to adopt regulations. The cooperation between the health and labor departments, and later, the city buildings engineer, produced good results.

Confidence in the program developed, and management and labor began to seek guidance on health protection from the department, he said. A senior medical supervisor for occupational diseases was appointed. Close working relationships with official and civic groups were found necessary for an effective program, he said.

Lead Poisoning

Lead poisoning was found to be an occupational hazard in Baltimore and a special blood-lead laboratory was set up to help pin down this disease in and out of industry. Children of teething age who had chewed on window sills were found to have become severely ill from the lead paint used at one time. The blood-lead laboratory helped in diagnosing this disorder, he said.

Another community service cited by Dr. Williams was the tracing of

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the attack
on
chronic
diseases



a "grain itch" type of dermatitis to an insect mite in a broom factory. The owners of the firm had requested the investigation.

Community Benefits From Industrial Medicine

Industrial medicine has achieved significant results in prevention and control of occupational injuries and diseases and, through cooperation with community health services, has contributed to the control and prevention of venereal diseases, pulmonary tuberculosis, and other infectious diseases, said C. D. Selby, M.D., resident lecturer in industrial hygiene, University of Michigan School of Public Health.

The responsibilities of both industrial medical services and community health programs are essentially those of private physicians, he asserted—the protection and preservation of community health. He felt, however, that because of their positions in industry and the specialized knowledge they possess, industrial physicians acquire additional obligations of mass "health maintenance."

The procedures of industrial health which offer the best opportunities for cooperation with community health programs, Dr. Selby continued, are: (1) examinations of applicants for employment; (2) employee examinations for health maintenance; (3) case finding; (4) consultation and advice to employees on their health problems; (5) health education; (6) industrial hygiene and sanitation; and (7) biostatistical studies of both occupational and nonoccupational employee disabilities.

Examinations Are Multiphasic

As an example of the opportunities these "tools" offer for cooperation with community health programs, Dr. Selby cited the examinations which assist greatly in multiphasic screen testing. Employee examinations are multiphasic and much more

complete and clinically sound than most community testing programs.

The industrial physician is interested in virtually the same health problems as the health officer, Dr. Selby continued, since both influence the quantity and quality of employees' work. He felt that they should cooperate especially in problems of accidents, home environment, occupational hygiene, chronic diseases and constitutional conditions of the aged, referral of patients to needed specialists and hospitals, rehabilitation of the crippled and disabled, and mental hygiene.

Periodic Health Survey Benefits Discussed

Periodic health examinations provided by many corporations for their employees should not be in competition with diagnostic clinics nor the practice of medicine in the community, said W. Leigh Cook, Jr., M.D., assistant professor of medicine, University of Pittsburgh.

He pointed out that corporations and groups of industrial workers have undertaken this preventive activity because a large number of people fail to seek a regular check-up.

In this type of examination the person is being screened for telltale evidence of lack of good general health, and, said Dr. Cook, he should not expect exhaustive diagnostic procedures.

Advantages of Check-Ups

One of the advantages to be gained from a periodic examination, according to Dr. Cook, is that the patient actually presents himself to a physician for an examination. The examination will also make the patient realize that his health is important not only to himself but to the corporation, he said, pointing out that a healthy employee is a good employee, while a sick employee is likely to make mistakes that cost the corporation needless losses.

Dr. Cook listed as a third advantage the discovery of infectious or degenerative disease processes, such as diabetes, hypertension, progressive arteriosclerosis, tuberculosis, anemia, leukemia, and tumors, which have not been noted by the patient. The patient with physical disabilities will be reassured concerning management of his problem, he said.

The last advantage outlined by Dr. Cook was the maintenance of individual records over a long period of time. These base-line laboratory and objective findings are important in evaluating a sudden illness or symptoms that might stem from a particular organ which has shown an abnormality in the periodic examination, he explained.

What To Include

Dr. Cook expressed the belief that adequate information for periodic survey purposes can be obtained from a careful medical history, functional inquiry, a complete physical examination, a blood count with differential, a complete urinalysis, an X-ray of the chest or an adequate fluoroscopic examination, and an electrocardiogram. He advised that records of these examinations be made available to family physicians. Those who have specific complaints should not be diagnosed in a periodic survey, but should go to their own physicians or diagnostic clinic, he said.

Basic Information Needed To Control Radiation

Without base-line information as to whether there are any appreciable number of people exposed to radiation in biologically significant amounts and how much of an increase in radiation would be required to reach such a level, it is difficult for public health departments to know what course to chart in the problems posed by the possibility of long-term radiation exposure, in the opinion of Duncan A.

Holaday, M.A., chief of the Salt Lake City radiation unit of the Division of Occupational Health, Public Health Service.

Questions for Health Officers

He said health officials should concern themselves with challenging questions such as these:

Just what are the radiation sources in your area and where are they located? Are all the X-ray machines situated in hospitals, doctors' and dentists' offices, and industrial establishments? Is this equipment properly safeguarded and by whom? Is any effort made to measure and record the exposure of the technicians who control this equipment? How much of the 600 gm. of radium used to make luminous paint in the last 10 years has come to rest in your area? What levels of radon are normally present in your area and how do atmospheric conditions affect these concentrations? How is the radium content of water affected by treatment schedules?

Geneticists have spoken out in plain words on the danger of receiving a lifetime dose of from 30 r to 80 r, and their opinions should be given more than passing attention, Mr. Holaday warned.

Geneticists report that such a dose would double the spontaneous mutation rate, Mr. Holaday explained.

Radiation is known to induce inheritable changes or mutations in animals, he continued, adding that humans are probably more sensitive to radiation than most animals. In contrast to most radiation effects which indicate that small radiation doses are not directly additive, genetic studies show that fractional irradiation doses have a cumulative mutagenic effect.

Sources of Radiation

Mr. Holaday presented data on small doses of radiation and listed the sources of radiation to which an average person may be exposed. These, he said, are:

Cosmic ray background. Exposure is estimated to be at least 0.1 r per year. This is inescapable.

Small amounts of radioactive elements which are distributed in water, soil, and air. If these were evenly distributed, which they are not, throughout the skeleton, they would deliver a radiation dose of about 0.8 rep per year to the bone.

Natural radioactive materials used in industry. Workers in carefully monitored installations receive total exposures far less than 15.6 r per year, the maximum permissible dose.

Doses from common diagnostic procedures used by radiologists. Some of these quantities are: chest, large X-ray, 0.1 r; chest, photofluoroscopic, 1.0 r; pregnancy, lateral, 9 r; gastrointestinal series, 4 r to 50 r; average dental film, 5 r; fluoroscopic examination, 10-20 r/min.

Instances of the use of radiation for such trivial purposes as the removal of superfluous hair.

Customer Can Rely on Chemical Suppliers

What are the chemical supplier's responsibilities to his customer? Edgar M. Adams, Ph.D., assistant director of the biochemical research department, Dow Chemical Company, Midland, Mich., answered that the supplier can be expected to inform the customer sufficiently

about the health hazards of his product.

Accordingly, he said, the supplier must obtain information on harmful properties of chemicals, advise customers of these properties and of precautions, and assure that the uses he recommends are appropriate. Only indirectly can the supplier influence the operations of his customer.

Types of Hazards

"The likelihood that a given product will cause harm of any sort will depend upon chemical and physical properties, toxicity, use of the product, and the type and number of customers," Dr. Adams pointed out. "A substance used as a chemical intermediate cannot offer a hazard even approaching that presented by substances going into such products as cosmetics, fabrics, and pesticides. Each individual use must be evaluated on the basis of the nature and intensity of the exposures which can occur. Entirely apart from the likelihood of difficulty, the seller of chemicals will assume a varying liability for the safe use of his products depending upon the type of product and the conditions of sale."

He added that "virtually no liability may be assumed when the use of the chemical is not known to the supplier."



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Because the chemical industry is characterized by variability with respect to products and their uses, customers, marketing procedures, and conditions of sale, the supplier must evaluate these factors for each product before meeting his responsibility for safe use, Dr. Adams said. Economically, it is not always feasible or effective to treat all chemicals alike. The producer of new chemicals must first obtain information on their chemical, physical, and physiological properties. Dr. Adams described three classes of tests to determine these.

Classes of Tests

Class 1 tests measure acute toxicity primarily, require but a small sample, cost but a few hundred dollars, and can be completed within 4 weeks. Their results form a basis for so-called handling precautions.

Class 2 tests are more extensive, yielding relatively precise measurements of acute toxicity and estimates of chronic toxicity, requiring about 6 months, and costing as much as 3 to 4 thousand dollars. They are conducted when the appropriateness of specific uses must be determined, or simply because of the wide distribution of an industrial chemical.

Class 3 tests are the most comprehensive and require hundreds of animals, or at times human subjects, 2 to 3 years for completion, and 30 to 40 thousand dollars. They are conducted when the use of a chemical requires a high assurance of safety and when a thorough understanding of toxicity is desirable because of widespread and diverse use.

The Manufacturing Chemists' Association has developed a system of labeling and promoting uniformity, the speaker stated. "The individual company has the task of designing proper labels and setting up procedures which assure the labeling of each container."

"The procedure of marketing may be utilized to assure the safe use of products which present hazards of exceptional seriousness and which require extensive precautions or pre-

cautions which are outside past experience of the customer," he said.

Occupational Diseases From Raw Materials

Surprisingly, occupational diseases associated with importation of raw materials into the United States have received comparatively little attention, commented Daniel C. Braun, M.D., medical director of the Industrial Hygiene Foundation, Mellon Institute, Pittsburgh, and John F. Osterritter, M.D., M.P.H., Graduate School of Public Health, University of Pittsburgh.

Limiting their discussion to a review of disease hazards from raw materials prior to processing, Drs. Braun and Osterritter said that handlers of raw materials are subject to many infections and infestations, numerous dermatoses, and certain pulmonary diseases such as asthma and pneumoconiosis. In addition, raw materials have been suspected of being involved in the causation of systemic diseases—notably cancer, and metal poisoning.

Human Anthrax

They named as one of the most common infectious diseases human anthrax, which occurs in all stages of the handling, transportation, unloading, processing, and weaving operations of wool and hair, and in the tanning of hides and skins. The incidence of industrial anthrax in the United States has shown a significant increase since 1939, attributable to increased importation of wool and hair for carpet manufacture, Drs. Braun and Osterritter indicated.

The reviewers listed other disease hazards in the infectious group: glanders and hoof-and-mouth disease related to the importation of livestock and derivative products; Q fever from handling goat hair, raw wool, dairy products, meat and stock; psittacosis from contact with birds of the parakeet family and their plumage; actinomycosis from contact with straw and certain an-

imals; "sealfinger," the colloquial name for a disease found among men who gather and handle seal pelts; and tetanus encountered in the handling of jute. Weil's disease, pemphigus, tularemia, tuberculosis cutis, schistosomiasis, malaria, yellow fever, and filariasis are contracted from rodents and insects infesting ships and coming in contact with cargoes.

Dermatitis Sources

Insect infestation is a major source of dermatitis. The parasite *Pediculoides ventricosus* and related organisms are thought to be etiological agents for a variety of itches, they said. Grain itch appears in epidemic proportions among workers handling rice, barley, and wheat. The lesion is frequently seen on the faces and necks of workers who carry sacks of contaminated material on their shoulders. Water itch is found among coolies working on tea plantations and others who handle tea. Cottonseed itch occurs among workers handling contaminated seed in bulk quantities.

Hookworm is another pest, Drs. Braun and Osterritter indicated. Its larvae are often contained in bits of mud, causing contamination in the bags, barrels, or boxes of rice, cocoa, and similar materials from Japan, South America, Puerto Rico, and the East Indies.

Dermatoses also result from contact with vegetable fibers, plants, and woods, the reviewers continued. Among causative agents are the Japanese lacquer tree, the Indian marking nut, the cashew tree, and the Singapore mahogany, all members of the notorious poison-ivy botanical family. Lemon grass oil used in perfume and as an adulterant for lemon oil is a potent producer of dermatitis. Figs and bananas have also produced skin irritations. Other malefactors include lance wood, imported from Cuba, Brazil, and Guiana and used for wagon shafts and handles; boxwood, walnut, rosewood, and cocobolo wood from the West Indies; and ebony from Brazil.

Philosophies and Practices In School Health

Sessions of the American School Health Association's meeting in Cleveland dealt with a wide range of topics, including an analysis of the philosophy and principles of the school health program and a review of trends in mental and dental health and in school nursing. In an examination of school education, the scope and scheduling of instruction for grades 1 through 12 were considered, together with a consideration of the preparation and placement of health teachers.

Basic Principles Underlie School Health Programs

Man is an indivisible entity; a cooperative group effort is a necessity; and any phase of education must reflect and demonstrate the democratic way. These are the three basic considerations which "must underlie our thinking and planning in school health education," declared Delbert Oberteuffer, Ph.D., professor and chairman, department of physical education, Ohio State University.

Discussing these considerations, Dr. Oberteuffer pointed out that although the concept that man—the child or student—is a unified whole, "not a segmented animal," is not new, "only recently have we begun to understand this unity and to act in accordance with its meaning."

"Whatever is done in health education," he said, "whether it is the teaching of an activity for endurance, examining the mouth for dental decay, or requiring knowledge of immune processes, must be done in relation to the problem presented

by that whole and individual organism . . . The full measurement of value in health education is its production of good for 'me,' not for 'my eyes' or 'my weight' or 'my body.' In modern health education the concept of 'body' disappears. So does the concept of health education as good for any fragmented part. In its place is the evaluation of the effect of health education upon the individual as a person."

Responsibilities

The second principle Dr. Oberteuffer discussed concerned administrative jurisdiction, overlapping responsibilities, and uncertain boundaries. "There are so many of us involved [in school health programs]," he said, "that for years we have struggled with the curious element of protocol that seems to surround us when educators, physicians, nurses, dentists, and others try to work cooperatively in a cooperative program."

He urged that all concerned carefully examine the situation. "The school health program requires many people to make it operate suc-

cessfully," he said. "Responsibility for the health of youngsters belongs to all who deal with them. Many talents are needed—medical, educational, nursing, administrative, psychiatric, and more. Why argue about which talent is the most important? What we have to realize is that we are all important to the welfare of the child . . ."

Moral Values

The third consideration involves the moral values within the school health education program. "We must examine the relationship between school health education and the social and political philosophy of our people," he said. "Whatever we do in the name of school health education must meet the needs of the people. But in meeting those needs for medical care or for health advice . . . we must not destroy the capacity for self-direction and the will of the individual to look after himself and his family."

"But, withal," he concluded, "let none of us forget that school health programs exist because American school children have the right to the best that science can offer to aid in their development. The Nation has the right to expect that we who are strategically placed to aid them in this development will bring every advantage to them."



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Teachers Need Training in Mental Health Concepts

It is generally estimated that 1 school child in 10 is emotionally disturbed and would profit from clinical services, Louis Jacobs, M.D., M.P.H., a regional mental health consultant of the Public Health Service, stated in a discussion of remedial and preventive services in mental health in the school program.

Dr. Jacobs quoted from a study made by the Committee on Mental Health of the College Health Conference which found that "about 15 percent of all college students could be expected to benefit from mental health services. Of these, 5 percent would be considered urgent cases.

In some colleges and universities psychiatric and student counseling services are available as part of the educational system, Dr. Jacobs reported. Teacher training institutions in general, he believes, could make good use of remedial services for the persons who will become classroom influences on the emotional health of their charges.

Clinical services should also be available to the 10 percent in the elementary and high schools who need professional help, Dr. Jacobs said. Community-wide use of these services is indicated, he said, whether the clinic is part of the school system, the local health department, or another community agency.

Stresses Teacher Training

In speaking of preventive services, Dr. Jacobs stressed the importance of the teacher in the training of emotionally sound individuals. It is her understanding of children and her own maturity that determines the kind of job she will do in bringing out the best in her pupils, he said.

Much is now being done to give the teacher the information and practice she needs in understanding mental health concepts in the classroom, he said. For graduate teachers, a number of schools have in-service

training programs, institutes, and workshops where thousands of teachers have received instruction from psychiatrists, psychologists, and social workers. In teacher training colleges, the student health and counseling services are a valuable source of health education, he stated.

Dr. Jacobs recommended that physicians and nurses in the school health program receive similar indoctrination in the mental health field.

In addition to trained teachers and personnel, a school health program needs material with which to work, Dr. Jacobs stated. The workers need the preschool history of the child as well as cumulative records during his school years. They need complete examinations of the children, including an expert appraisal of their personalities.

By working for good facilities and services in every phase of health, by taking advantage of every educational opportunity, and by allaying fears and anxieties in their charges, health workers could make the schools a worthy second to the home in helping develop mature personalities, Dr. Jacobs concluded.

School Dental Programs Influenced by Research

Research in the field of dental caries prevention has been one of the factors significantly affecting school dental health programs, according to a survey of trends presented by Lester A. Gerlach, D.D.S., dental director, Milwaukee Health Department.

Dr. Gerlach noted that research in caries prevention has proceeded along two avenues of approach: the use of fluorides on the surface of the tooth, and the use of agents, such as ammonia, vitamin K, and others, to control the tooth's environment.

School dental health programs, he indicated, are aimed primarily at the prevention of dental caries through

the use of these newer techniques supplemented by a good educational program. "Both the fluoride water therapy and the topical application of sodium fluoride are becoming more of a reality all the time," he stated. "Although good, the fluoridation method of preventing dental caries is not a cure-all and must be augmented with a good dental health educational program."

The trend is toward streamlining the program and limiting the use of trained personnel as much as possible, he declared. The shortage of dentists and dental hygienists has made mandatory the use of allied workers and auxiliary personnel whenever feasible. He suggested that health educators, the school medical and nursing staff, and teachers can disseminate dental information.

A paramount consideration in future school dental health programs, he stated, will probably be the education of parents regarding the known caries preventives—their benefits and their limitations—and the encouragement of better dental hygiene in the home. There also exists a great need for attention to phases of dental health other than caries—malformations, malocclusions, crooked teeth, periodontal disturbances, infections, and oral manifestations of general systemic conditions, he concluded.

Study of School "Programs" Indicates Needed Revision

Ten suggestions for improving school health instruction programs were offered by Dora A. Hicks, M.A., chairman of professional health education, University of Florida.

From a review of the literature on current theories of health education and from a study of present practices in city schools as determined from replies to questionnaires, Miss Hicks concluded that attention should be directed toward the following measures:

Inform teachers, health personnel, and the general public of newer concepts in health instruction; improve school environments; conduct and promote original, organized health research among students, teachers, and community groups; establish college graduation requirements in basic health and hygiene for all students; include instruction in health education in certification requirements for teachers.

Also, provide regular school time for health planning and instruction; establish functional health committees in every school; evaluate and revise the health curriculum regularly; develop comprehensive State health teaching guides with suggestions for local use; and develop local health teaching guides that provide for articulation and continuity of health instruction.

Present Practices

Current methods used in developing health programs for grades 1-12 were investigated by sending questionnaires to the directors of curriculum construction in 75 large city schools, Miss Hicks reported. Replies, received from 39 schools, indicated how health needs were determined and how problem areas were selected, and listed the most neglected areas of health instruction and topics which should be included in a modern health education curriculum.

Briefly, the study revealed that:

Twenty-eight percent of the cities consider the use of State guides the best procedure for selecting problem areas, but 38 percent use a State outline or course modified to fit local conditions. Sixty-two percent of the cities indicated that it is best to use State guides as a resource only.

Sixty-two percent reported that it is not practical for individual teachers to determine the scope of health instruction because they are not qualified and because continuity cannot be accomplished by this procedure. The 38 percent in which individual teachers determine the scope pointed out that they should

work on various committees, with guidance, and should select units only within a basic framework.

Ninety-three percent indicated that their health instruction programs provide for articulation and continuity of instruction from grade to grade without unnecessary duplications or undesirable gaps.

Forty-five percent of the cities indicated that mental and emotional health was the most neglected area in their programs, and 21 percent reported insufficient emphasis given to sex education and to personal health.

Twenty-five percent of the cities listed as necessary topics for instruction: personal hygiene, mental health, sex education, nutrition, infection and disease, and body structure and function.

Urges Flexible Planning In Health Teaching

The need in grades 1-12 for health instruction on an equal basis with other important instruction was emphasized by J. Keogh Rash, Ph.D., chairman of the department of health and safety in Indiana University's School of Health, Physical Education, and Recreation.

Discussing the scheduling and se-

quence of health education in the school system, Dr. Rash said that proponents of the "continuous emphasis" plan reason that since the establishing of desirable habits is one of the major objectives of health education and can only result from repeated exercise, it follows that continuous emphasis must be placed on those habits which are to be encouraged.

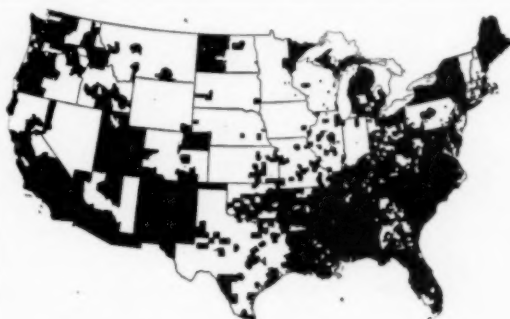
Supporters of the "opportunistic" plan propose using a psychological approach to health instruction, he said, explaining that a particular health problem is emphasized whenever the ideal opportunity for successful teaching offers itself.

Followers of the "cycle" plan seek to reinforce previous learning of special health problems by singling out a special health problem every few years for intensive study because of the growing child's changing needs, interests, and abilities.

In Practice

Each plan has its individual disadvantages, Dr. Rash said. The continuous emphasis plan is probably the oldest and most widely used; and the opportunistic plan has widest application in the kindergarten and first grade.

The cycle plan first appeared in the 1933 Indiana State course of study for elementary schools. Its first state-wide application was to all



full-time local health services

1920—138 counties

1952—1,637 counties

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grades in Oregon during 1945-46, he said. In 1948, Virginia adopted some of its principles. He continued:

"The new course of study in health education for Indiana, now in the try-out stage, suggests a combination of the cycle plan and the continuous emphasis plan. In certain problem areas, notably personal hygiene, the cycle plan is suggested while in other areas, notably nutrition, the continuous emphasis plan is suggested. The State law in Indiana requires instruction concerning the effects of alcohol and tobacco in grades 4 to 8, inclusive, so that the continuous emphasis plan will, of necessity, operate in this area during those years."

"The particular plan is not important," he concluded. "What is important is that there be conscious planning at the local level on the basis of the criteria of need, interest, comprehension ability, and ability to do for one's self. There must be sufficient flexibility to allow for continuous emphasis when necessary, and for use of the psychological approach when it seems desirable. In reality, the solution to the problem of scheduling and sequence rests not so much in a particular plan as it does with the planners."

School Health Activities In Cleveland Reported

The program of school health services offered in the Cleveland public schools was reported to the American School Health Association by Charles F. Good, M.D., director of school health services of Cleveland's board of education.

Emphasis is placed on prevention and early detection of deviations from good health, said Dr. Good. He felt that the primary responsibility for children's health is with the parents and that the basic role of school health programs is to assist medical and dental services already existing in the community.

Cleveland's school health budget has varied according to school enrollment, he continued, but it has gradually grown during the years.

In 1952 the over-all costs of school health services in Cleveland were \$3.80 per pupil, and costs of supplies averaged 4½ cents per pupil. However, these figures do not include special items of equipment which are acquired or replaced at times, even though the health service budget is part of the educational budget of the school system.

Health examinations of pupils—especially preschool examinations—have been stressed in Cleveland, said Dr. Good. He felt that such examinations are educational experiences, for parents may get advice on their children's needs from the school physician and nurse and then seek help from the family physician, dentist, or other community medical resources.

Follow-Up Stressed

But physical examination without adequate follow-up in each case of discovered disorder is fruitless, he continued, and in the Cleveland program the school nurse has the primary follow-up responsibility. She maintains a "work book" in addition to a permanent, accumulative pupil's health record card, and stresses the desirability of parental consultation with herself, a family physician, a teacher or principal, or appropriate clinics or specialists.

Besides general and special health examinations and the follow-up system, the Cleveland program provides also: eye and ear clinics for selected pupils; tuberculosis prevention and detection activities; dental examinations and mouth hygiene instruction; and psychiatric consultation for referred pupils.

The 24 part-time school physicians in Cleveland are assigned to one or more schools each morning during a week. When smaller schools are assigned to a physician he may divide his time among them or visit them on alternate weeks. Each physician has about 5,500 pupils in his weekly school assignment.

Nurses' assignments include a number of schools in adjoining neighborhoods with enrollments of about 2,200 children. Schedules are ar-

ranged to coincide with physicians' schedules. Time is allotted to each school so that schools of 500-600 enrollment have about 3 half-days of nurses' time each week and larger schools have more time proportionally.

At the present time, continued Dr. Good, the Cleveland school health program has no orthopedic diagnostic service. Most orthopedically handicapped children are now referred to and accepted at the Sunbeam School for Crippled Children when unable to attend regular school. This school, he added, has an enrollment of about 140 children and serves the entire county. Besides the school nurse and physician, the school has four physiotherapists, a speech teacher, and numerous attendants, thereby stressing not only educational progress but also the adjustment of the handicapped child to adult responsibilities.

Field of School Nursing Is Reported Growing

The steady increase in the number of school nurses employed by boards of education—from 3,477 in 1937 to 6,088 in 1951—indicates that school nursing is becoming a specialized field of public health, averred Emily S. Brown, R.N., head nurse of the Elizabeth, N. J., board of education.

Other trends noted by Miss Brown were better preparation of school nurses, a closer alliance of the nurses with educational and school organizations, and an increasing drive toward organization themselves.

She felt that administration of school health services by boards of education is particularly desirable in large or moderate-size city schools. "School nursing cannot be conducted adequately unless the nurse's time is devoted entirely to the school," she declared.

In progressive school systems the school nurse is a health counselor, educator, and consultant—an important contributor to the child's educational experience, she continued. This, in turn, has drawn the

nurse into educational organizations to share in the over-all plans and objectives of the teaching profession.

Deploing the disparagement of specialized school nursing, Miss Brown declared that school nurses are not responsible for the alleged overlapping of public health nursing activities. They do not live in an "ivory tower," unaware of the needs and lives of the families of the children they care for, she said.

School nurses are not always able to satisfy their needs in regular public health nursing programs, she said. Many have to meet health teaching requirements and prefer to take work in health education, thereby having to sacrifice some areas of recognized public health nursing curriculums. She felt that school nurses should be accredited for study programs in health education as well as in public health nursing.

Miss Brown concluded that strong organization is needed among school nurses to better interpret their work to other public health groups and thus achieve greater recognized status.

School Health Education Viewed as Specialty

Teachers of English, history, music, or any other specialty are pinch-hitting as health instructors in our schools, according to Jennelle V. Moorhead, M.S., associate professor of health education, University of Oregon.

Lack of certification requirements for school health teachers allows school administrators to assign health courses to any teacher with a free period, she asserted.

In a study of the transcripts of 307 health teachers from 83 percent of the Oregon high schools, Miss Moorhead found majors in 31 different fields. Only 37 percent had majors in physical education, home economics, or biology, three of the fields recommended by national committees as suitable background for health teaching.

The newness of school health edu-

cation as a specialty has contributed to the lack of properly prepared health teachers, Miss Moorhead indicated. It has developed as a field separate from physical education since the late 1930's. Young people, who seldom see a health specialist at work, do not think of health education as a career, she said. Even vocational counselors in high schools and colleges may not regard it as a field of specialization.

Few institutions of higher education offer a bachelor's degree with a major in health education—only 41 of the 1,688 institutions surveyed by the Office of Education in 1949, Miss Moorhead continued.

Although schools generally agree on the basic subject matter of the courses offered, they differ on course scope and content and on the number of credits needed to insure competence as a specialist, she said.

534 Health Topics

As an indication of what the health teacher should know, Miss Moorhead cited an analysis of the Oregon course of study for health. This showed that the Oregon high school health teacher is expected to teach 534 separate health topics in the nine major health units—personal hygiene, community health and sanitation, communicable disease, nutrition, mental health, first aid and safety education, choice and use of health services and health products,

physiology of exercise, and structure and functions of the human body.

Sixteen training courses, Miss Moorhead found, were important in determining how well prepared the teachers were for health instruction. She recommended that other States make a similar job analysis for their health teachers.

After training the health education major, we must also place him, Miss Moorhead stated. School administrators have stressed the importance of health subjects, but in actual practice they do not designate a place on their staffs for a health specialist, she declared, explaining that the situation is further complicated when people in the field of health education recommend the integration of health education into other areas in the high school curriculum.

To obtain for health education its proper status in the schools, health educators must first agree on a course of study for training health teachers, Miss Moorhead concluded. They must offer concrete suggestions on what is to be taught in various grades and how it is to be taught. They must sell school administrators on the importance of health education. And they must get young people interested in school health education as a profession through work with parent groups and with high school and college guidance personnel.

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the health of
mother and child

Maternal and Infant Mortality Surveys and Evaluations

As a factor influencing maternal and infant mortality, anesthesia was mentioned frequently in the sessions of the maternal and child health section. This factor appeared of significance in a study of the premature born in a Kansas hospital and in one reporting the results of a Minnesota survey. In another presentation before the section, a report was made on the quantitative adequacy of prenatal care in a middle-sized community.

Probe of Specific Factors In Infant Death Advised

Research on the causes of infant mortality should henceforth be concentrated on hygienic practices, "mothercraft," and similar factors within given income and occupational groups, Odin W. Anderson, Ph.D., associate professor in charge of the social aspects of medicine, University of Western Ontario, Canada, believes.

Dr. Anderson indicated that further research on the general relationships between infant mortality and income level, class, and occupation would be a waste of time, money, and effort. The general social factors affecting infant mortality have been conclusively established, he said. A synthesis of the profuse data on infant mortality during the past 100 years, and in more detail the past 50 years, shows clearly that a high infant mortality rate is associated with poverty.

Enlarging on known facts, Dr. Anderson stated that mortality rates begin to drop perceptibly in many

countries at a certain stage of their technical development. In fact, it would seem reasonable to assume that when the infant mortality rate in any area falls below 30 per 1,000 live births, he said, the economic factor becomes less and less operative as a general cause of mortality, and other factors, such as mothercraft, intelligence, personality, and specific hygienic practices, become more operative.

Dr. Anderson suggested that any further search efforts be directed at this complex of factors within specific groups.

Feeling of Personal Worth Basic in Prenatal Care

A sense of personal dignity and worth that prompts women to seek care early in pregnancy is a prerequisite to an effective prenatal care program, a study sponsored by the Rochester Health Bureau and the University of Rochester School of Medicine and Dentistry, New York, found.

Making the study of the quantitative adequacy of prenatal care in the medium-sized urban community of Rochester were Alfred Yankauer, M.D., M.P.H., director of maternal and child health services, New York State Department of Health, and Kenneth G. Goss, M.D., and Salvatore M. Romeo, A.B., public health interns of the department.

Most of the women, regardless of economic status, sought early aid, but a small number of women of low socioeconomic status neglected to seek care until late in pregnancy, the investigators reported.

Socially Disorganized

A study of a group of socially and economically underprivileged women

who failed to get early prenatal care revealed a greater degree of social disorganization in comparison to a group of similar status who sought care. In the study group there were more out-of-wedlock births, greater mobility and fertility, and a greater degree of welfare dependency. The incidence of birth weights of less than 2,500 grams and of neonatal deaths was significantly higher in this group.

The investigators concluded that the women with adequate care were able to translate their feelings of personal worth into sound health practices and bear healthy children. Failure to seek prenatal care, they termed an outward manifestation of the rejection of pregnancy and the loss of a sense of personal dignity. These attitudes affect the fetus adversely by way of maternal nutrition and pattern of living, they stated.

Helping these women attain a sense of dignity and worth is a task confronting the community as well as the public health and social worker before prenatal care techniques and knowledge can be effective, they said.

Minnesota Survey Reveals Lower Maternal Mortality

The reduction in the maternal mortality rate in Minnesota from 2 in 1941 to 0.3 per 1,000 live births in 1951, although a great improvement, is not the maximum possible, according to A. B. Rosenfield, M.D., M.P.H., director of the division of maternal and child health, Minnesota Department of Health.

In many States maternal mortality rates are now lower than was thought possible 10 years ago, but surveys show many maternal deaths could be prevented, he said.

The Minnesota survey of 1941-42 was resumed in 1950 and is now in its third year. Eight physicians selected by the maternal health committee of the State medical associa-

tion in addition to Dr. Rosenfield are on the committee conducting the survey.

The survey includes in its coverage all women who die during pregnancy or within 3 months postpartum, regardless of the actual cause of death. A State health department regulation helps the committee get prompt notification of maternal deaths. An obstetrician investigator visits the hospitals and reviews charts, nurses' notes, anesthesia records, and pathologists' reports. The investigator also interviews hospital personnel, visits the attending physician and obtains the history, including prenatal care. He interviews the consultant, if there was one, and relatives if data is needed from them.

The committee reviews the investigator's report, and its determination of cause of death is mailed to the attending physician and to the consultant.

The 1950 survey showed (in comparison with the 1941 survey) a 40-percent increase in the number of live births, a 35-percent increase in the number of hospital births, and an accompanying decrease of 70 percent in maternal mortality. Marked improvement was noted in prenatal, delivery, and postpartum care although some deaths were still attributable to faulty care.

Dr. Rosenfield asserted that anesthesia is becoming a more important factor in maternal mortality. In 1941, he said, anesthesia was responsible for three deaths (3.2 percent) but accounted for four deaths (8.7 percent) in 1950. However, anesthesia contributed to 12 additional deaths.

Other significant survey facts were: Consultations increased from 44 percent in 1941, with 9 percent considered adequate, to 57 percent in 1950, with 32 percent considered adequate. Over half the deaths in both years occurred in women who had operative deliveries. In 1941 three-fourths of the maternal deaths were considered preventable; in 1950 only one-third were considered so, he said.

Use of Analgesia Opposed In Premature Labor

"The use of analgesia in known premature labor deserves nothing but condemnation," declared Russell A. Nelson, M.D., of the Wichita Foundation of Medical Research, and Francis E. Barry, M.D., Maj., U. S. Air Force, Lackland Air Force Base, San Antonio.

They stressed that drug depression by any analgesics, hypnotics, sedatives, or anesthetics may cause anoxia of the premature and that medication effects are more profound in the fetus than in the mother. If general anesthetics must be used, they recommended nitrous oxide and oxygen, no stronger than 80 percent nitrous oxide.

The physicians felt that painless labor produces threats to the infant and should not be offered. Short labors with some relief will give infants in better condition, they said.

Their conclusions were based on a study of all liveborn infants from 500 to 2,500 gm. born in 1949 and 1950 at St. Francis Hospital, Wichita, Kans. The hospital's incidence of premature births is about 7 percent, with a death rate for this group of 21.8 percent.

Regarding the use of analgesia and its effect on 246 perineally delivered prematures studied, they reported

that no infant under 1,000 gm. receiving analgesia survived while 50 percent of those receiving no analgesia did survive. From 1,000 to 1,500 gm., 75 percent of the infants without analgesia survived, compared with 56.3 percent of those having it. All in the 1,500 to 2,500 gm. group receiving no analgesia survived. Of those having analgesia, the death rate was 20.9 percent for the 1,500-2,000 group and 9.5 percent for the 2,000-2,500 group.

Warn Public

Public health programs should warn the public of the danger of heavy sedation and general anesthetic for delivery of the average baby, they said. They advocated more attention in medical schools to premature labor and immediate care of premature infants.

Most anoxic and atelectatic infants die in 24 hours, they continued. They felt that both the general practitioner and the specialist should be adept at resuscitation, including tracheal intubation and aspiration. When infants are delivered in poor condition, oxygen and an airway are of primary importance, they emphasized.

The doctors felt that death conferences should be held in all hospital obstetrical departments, just as surgical material is examined for pathology.



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Water Fluoridation Programs And Community Health

The water fluoridation program and community health were discussed at a joint session of the APHA sections on dental health, public health education, and public health nursing with the American School Health Association and the Conference for Health Council Work. Topics included an appraisal of the water-borne fluoride-to-dental caries relationship, toxicological evidence of safety in the use of fluorine techniques and a statement on the public health nurse's role.

In another session, the engineers looked at fluoridation in terms of benefits, safety, and current practices. In still another session public health dentists discussed the prefluoridation base-line survey and also considered the effect of topically applied stannous fluoride on caries experience.

Research on Fluorides A Continuing Project

Continued and even expanded research on the relation of fluorides to dental health was recommended by H. Trendley Dean, D.D.S., director of the National Institute of Dental Research, Public Health Service.

Although fluoridation of public water supplies for the partial control of dental caries is an accepted public health procedure, a public health problem can never be considered closed, Dr. Dean asserted.

In presenting the current status of fluoridation, Dr. Dean said that nearly 8½ million residents of 427

communities, distributed among 42 States and the District of Columbia, were using fluoridated water supplies by September 15, 1952. This preventive measure had been approved and plans were under way to start the program in an additional 299 communities with more than 15 million residents, he said.

Dr. Dean noted that extensive research has accompanied the program. The inquiry into the effect of fluorides on dental caries expanded into many areas heretofore thought far removed from dental hygiene, he said. He named as among the specialized fields profitably used in the systematic development of the study: basic research in analytical water chemistry, physiology and biochemistry, biometry, pharmacology, histology and pathology, microbiology, dentistry, medicine, public health, sanitary engineering, and water works operation. Explored to a lesser extent but nonetheless important, he said, were geology, hydrology, climatology, veterinary medicine, physical chemistry, and biophysics (radioactive isotopes, electron microscopy, and electron diffraction).

Further research can perhaps improve the effectiveness of fluorides, Dr. Dean concluded, and there remains further exploration of the response of a mass population to a changed physiological environment.

Nurses Have Teaching Role In Community Fluoridation

The public health nurse has a major educational role in a community water fluoridation program because of her direct relationship with the individual, the family, and the community as a whole, said Esther A. Schisa, R.N., B.S., public health

nursing director of the Ulster County Health Department, Kingston, N. Y.

The addition of the water fluoridation program to public health dentistry merely necessitates equipping each nurse with knowledge of the relationship of fluorides to dental caries, she continued. The nurse, who more than most directly interprets a health department program, must then not only emphasize the importance of good nutrition, cleanliness, supervision by a dentist, and other aspects of dental health, but also must understand the techniques of water fluoridation, the community need for the program, its costs, practical aspects and effectiveness, and methods of control.

Miss Schisa emphasized that the public health nurse should maintain an objective viewpoint toward water fluoridation regardless of her personal sentiments and beliefs.

Toxicology Tests Show Fluorides to Be Safe

Replying to critics of fluoridation, Francis F. Heyroth, M.D., assistant director of the Kettering Laboratory, University of Cincinnati College of Medicine, said that toxicological evidence assures the public that it can safely drink from communal water supplies containing optimal fluoride concentrations.

Unless public health authorities inform the public of the evidence upon which they base their beliefs in the safety of fluoridation, many will accept statements that little is known of the toxicity of fluorides or that the epidemiological evidence relied upon by fluoridation advocates fails to reveal adequately any adverse effects that may be associated with individual variations in susceptibility, Dr. Heyroth stated.

He outlined in some detail the extensive toxicological evidence now available and paid particular attention to acute and chronic toxicity, histological and histopathological changes in animal experimentation,

industrial human fluorosis as well as the experiments with human cases.

He pointed out that animal experimentation shows that the prolonged intake of quantities of fluoride too small to induce dental fluorosis does not give rise to any of the nondental manifestations of chronic intoxication by fluorides. Epidemiological data and clinical and radiographic examinations of exposed industrial workers indicate that only when the fluoride content of a water supply exceeds 5 or 6 ppm will its prolonged usage give rise to detectable osseous changes, and then only in the most susceptible persons, the laboratory director reported.

Toxicological Experiments

There need be no fear of acute poisoning as a result of the accidental or deliberate overfluoridation of a water supply, Dr. Heyroth emphasized. The only toxic hazard to be associated with fluoridation would be that of the cumulative action of small amounts taken daily over a long period, he asserted. The lethal dose in rabbits is 50 to 200 mg. of fluoride ion per kilogram of body weight. In human self-experimentation, as much as 250 mg. of sodium fluoride has been taken at one time without harm, he stated.

"It may be concluded from the results of animal experimentation that interference with growth cannot be induced by a daily intake too small to give rise to dental abnormalities and that only after the bones have stored considerable quantities of fluoride does any impairment of skeletal function occur," he said.

For the past 12 years, the Kettering Laboratory has conducted painstaking investigations to learn the rates at which storage in human bones occurs when known amounts of fluorides are ingested daily. By analyzing duplicate amounts of all food and liquids ingested daily by selected subjects over prolonged periods, the average daily intake of fluoride of each subject was measured. Two were found to have in-

gested 0.49 and 0.72 mg. of fluoride per day, and appeared to be in metabolic balance with respect to fluoride. One of the two ingested 6 mg. of extradietary fluoride (sodium salt) per day over a period, and retained the equivalent to 0.095 mg. per kilogram of body weight. Over a long period, two others took daily doses of sodium salt, equivalent to 0.05 and 0.14 mg. per kilogram respectively. In neither subject have radiographic changes occurred in the density of the bones, although one took more than 20 gm. of sodium fluoride during a period of 120 weeks.

Dr. Heyroth referred to the brief balance experiments, in which an attempt was made to measure elimination through the skin, and the conclusion that when daily intake did not exceed 4 or 5 mg. the major portion was eliminated from the body.

Panel Summarizes Data On Water Fluoridation

Introducing a panel discussion on fluoridation, Charles R. Cox noted that its purpose was the summarization of accumulated data on the subject. Mr. Cox is chief of the water supply section, bureau of environmental sanitation, New York State Department of Health.

The public health administrator is confronted with the need for answering the medical, dental, and toxicological arguments against fluoridation which have been brought forth by some groups and individuals, and the public health engineer and the water works official have the problem of establishing satisfactory procedures and controls for the fluoridation of potable water supplies, Mr. Cox pointed out.

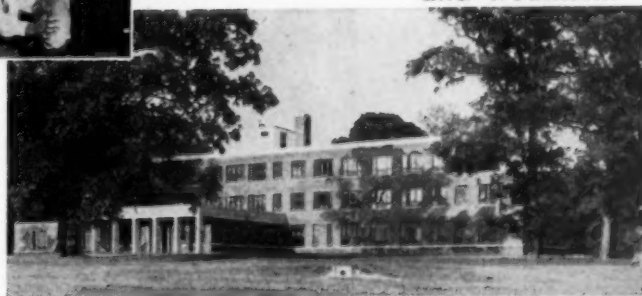
He assigned the problem of appraising the medical, dental, and toxicological data to the specialists in these fields. A recent statement by the board of directors of the American Water Works Association, reaffirming and augmenting their policy announced in 1949, clearly supports the attitude that the fluoridation of public water supplies represents a dental health program, the basic policy for which rests with medical and dental health directors, he said. It is significant, he observed, that the fluoridation of public water supplies is supported by the following associations of responsible public health administrators: State and Territorial Health Officers Association, State and Territorial Dental Directors Association, American Association of Public Health Dentists, and the Conference of State Sanitary Engineers.

Mr. Cox also pointed out that the technical data resulting from re-



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search and experience have led the following national technical associations to support the fluoridation of public water supplies: American Public Health Association, American Medical Association, American Dental Association, and National Research Council. Clearly, he said, these organizations did not give their support lightly but only after careful study.

Taking part in the panel were David B. Ast, D.D.S., director of the bureau of dental health, New York State Department of Health; Julius S. Cass, D.V.M., Kettering Laboratory, University of Cincinnati College of Medicine; John M. Hepler, C.E., director of the division of engineering, Michigan State Department of Health; and Norman E. Jackson, whose presentation is reported below.

Nation's Capital Begins Fluoridation of Water

Fluoridation of the Washington, D. C., water supply in the amount of 1 ppm began in June 1952 with the opening of the Dalecarlia filter plant, reported Norman E. Jackson, M.S., chief of the Washington Aqueduct's Dalecarlia section in the Washington district of the U. S. Army Corps of Engineers.

Mr. Jackson traced the development of the fluoridation program from its origin in the District Department of Health's bureau of dental services through its consideration by District departmental, public and governing authorities to its review by Congress and final enactment into law. He then made the following observations from experience at the Dalecarlia plant:

Large installations should order sodium silicofluoride (the fluoride agent used in Washington) in carload shipments of large drums rather than paper bags, because of the quantity necessary and the toxic dust hazard in bag breakage. Vacuum pneumatic handling of the agent with properly designed, in-

stalled, and maintained equipment practically eliminates the dust hazard, but protective personnel equipment and clothing also should be used as a safety precaution.

The tendency of sodium silicofluoride to conglomerate into lumps during storage can be partially reduced by filling the storage bins to only 10 percent of capacity, thus reducing weight and detention period. This procedure, however, does not solve the problem of large tonnage storage. Should bins or hoppers with sloping bottoms be used, the minimum angle should be 60 degrees with the horizontal. A more desirable installation and a better gravity flow will be achieved if bins and hoppers have one vertical side.

Screening Urged

Before being introduced to filtered water, the fluoride solution should be adequately screened for foreign matter. In the installation of piping, hard rubber pipe is recommended for rigidity needs and polythene-base plastic pipe for flexibility and non-corrosive qualities.

Although not proved conclusively, alum flocculation seems to adsorb the fluoride. With medium dosage of 1.1 gr./gal. the adsorption loss is only 5 percent, but with high alum dosage of 2.5 gr./gal. the loss may reach 30 percent. Adsorption loss in reservoirs and distribution is inconsequential.

The chance of overdosage of fluorides is negligible, provided there is proper equipment and alert and competent supervision.

Conduct Base-Line Survey Before Planning Program

"The promotion, institution, and evaluation of fluoridation are presenting unique opportunities for a fresh approach to the establishment of community dental programs and enhancing their likelihood of success," said Norman F. Gerrie, D.D.S., M.P.H., Public Health Service, Denver, Colo.

In discussing the planning of community dental programs, Dr. Gerrie emphasized that the prefluoridation base-line survey gives the community its best means of obtaining authoritative information on its current dental health status. No dependable plan for a dental health program can be constructed without such facts, he said.

He pointed out that the inclusion of the local dentist in the base-line survey will help the dentist to see first-hand the status of his community's dental health and to understand better the statistical and public health significance of the data. It will also enable him to participate more actively and authoritatively in the planning of a program to fit the needs of the community and to recommend program content consistent with his inclinations and abilities and the community resources. The public health dentist should act as consultant and catalyst in such surveys, Dr. Gerrie added.

Outlines Steps to Program

In forming a community dental program with both short- and long-range objectives, the following steps were recommended:

1. Securing base-line dental caries data by a community survey. If there are no local practicing dentists to make the survey examinations, the services of a public health dentist or private dentists from nearby communities should be used.
2. The data should be processed, analyzed, and interpreted by the public health dentist in detailed reports to the local dentists and to a local committee of responsible citizens. The data should be easily comprehensible and accompanied by charts, graphs, and recommendations.
3. At subsequent meetings of the committee, which should include dental representation, a program should be formulated with objectives and methods chosen according to the extent of the problem, the desires of the groups and individuals involved, and the resources of the community.

4. A critical, periodic evaluation of the program to measure progress toward objectives.

Stannous Fluoride Reduces Tooth Decay in Children

A 56-percent reduction in the number of newly decayed teeth was noted in children whose teeth had been treated topically with stannous fluoride, compared to a control group of children who had received a dental examination only, reported Charles L. Howell, D.D.S., M.P.H., Charles W. Gish, D.D.S., and Roy D. Smiley, D.D.S., assistant director, dental consultant, and director, respectively, of the division of dental health, Indiana State Board of Health.

Four groups of children in Bloomington, Ind., were studied in 1951 to determine the effectiveness of stannous fluoride in preventing tooth decay in the permanent teeth of young children, the dentists said. The first group of 210 was treated with sodium fluoride; the second group (382) was treated by use of the same technique with stannous fluoride; the third group (409) was treated with stannous fluoride using a different method mainly keeping the tooth surfaces moist during treatment; and a fourth served as a control group. Both stannous fluoride groups had a higher ratio of teeth recorded as carious in 1951 and noncarious in 1952 than either the sodium fluoride or the control group.

Compared to the control group, the reduction in number of newly decayed teeth after 1 year was 54.8 percent for the first group, 56.4 for the second, 53.6 for the third, according to the report.

Keeping the surfaces of the teeth moist throughout the treatment period did not increase the caries-reducing potential of stannous fluoride under the conditions of this study, they stated.

Dr. Howell and his colleagues

recommend assignment of children to treatment groups by age and previous dental caries experience rather than by random distribution of numbers, which they said resulted in groups unequal in age and in numbers of decayed, missing, and filled teeth.

No Evidence of Pathoses From Fluoride Ingestion

"Objections to fluoride ingestion from water supplies as productive of various pathoses have had no support beyond vague 'might be' or 'could be' or 'we don't know' expressions," declared Frederick S. McKay, D.D.S., Sc.D., of Colorado Springs, who first traced "mottled enamel" to heavily fluoridated natural water supplies.

"The best informed scientific opinion available is emphatic in declaring that there is no submitted evidence of any pathoses associated with such fluoride ingestion," he continued in his discussion of the relationship of water-borne fluorides to dental caries.

Fluoridation is a natural phenomenon and not an experiment, he asserted, and recalled that its discovery came in a study to find the cause of "mottled enamel." The low amount of caries that went with

mottled enamel was not recognized for many years.

Dr. McKay pointed out that 23 States have naturally fluoridated water supplies, some with as much as 3 ppm and more as against the recommended 1 ppm, and no evidence of damage to the inhabitants has been uncovered. He noted that such places would be ideal for finding evidence of illness caused by fluoridated water.

Fluorosis, even to an extremely disfiguring degree, can be produced when the fluoride content is 2 ppm or more, but the caries experience rate may be and often is low. However, there are persons who use water with 2 ppm of fluoride and higher with no visible fluorosis and a low caries experience rate. Although there is no explanation for this, it is of extreme importance, he stated, that this "not visible" fluorosis has a caries resistance equal to that of visible fluorosis.

Dr. McKay credited the Public Health Service studies with establishing the relation between fluoridated water and the dental caries rate. When the fluoridation of our water supply becomes general throughout the country, he said, the dental profession will be within "striking distance toward control of the damage to and loss of the teeth by caries."

today
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tomorrow

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Field Research and Appraisal In Health Education

Planned, organized, objective investigations of the "why" of health education are becoming more frequent, reports to the APHA of going projects revealed. In a symposium on "current research affecting public health education" as well as in other sessions, some dozen presentations were made. Those for which texts were available are summarized here

Use of Behavior Knowledge Underlies Program Success

There is no better place than the field of public health to put to use available knowledge on why people behave as they do, in the opinion of Nancy Starbuck, Ph.D., education psychologist in the Division of Dental Public Health, Public Health Service.

Three principles of human behavior which seemed applicable to the problem of community organization were tested in six communities previously visited by a topical fluoride demonstration team. Dr. Starbuck stated that three communities had established continuing programs after the teams had left; three had not. The research problem was to find out why some community leaders set up continuing programs and others do not, she reported.

To reach a decision to initiate and carry out a program, Dr. Starbuck said, community leaders must regard it as a means of solving a problem and an aid to accomplishing their own objectives, as well as feeling that they have initiated the program and that others in the community want it. Community leaders and program administrators must agree

on its purpose, and objectives, and accept the methods employed, she stated.

How Principles Operate

In the communities which continued the programs, the leaders saw a direct relationship between their own objectives and those of the program, and reported that the demonstration team had been invited by the local people or through local and State officials, she said. Community groups had been solidly behind the leaders both in requesting the team to come in and in continuing the program after its departure. Most community leaders realized the long-range purpose of the program and had discussed continuing it after the team left. "Logical" groups—dentists and physicians, city and school officials—predominated in the planning.

In the three communities which did not continue the program, Dr. Starbuck said that local people had had no part in the decision to invite the demonstration team; they did not support the leaders; they had no appreciation of the long-range objectives of the program; the planning group was composed largely of civic groups, PTA's and fraternal organizations; and the leaders did not like the methods used.

Michigan Tests Response To Survey Publicity

Janitors and caretakers in semi-slum areas may play an important role in getting their tenants—especially the foreign-born tenants—to have their first chest X-rays.

This case-finding clue was reported by Norbert Reinstein, M.P.H., director of the Tuberculosis and Health

Society of Detroit during a study of factors which influence people to have X-rays. Using health department sanitarians as emissaries, an educational program was launched to enlist the support of janitors and caretakers in the next X-ray campaign. Result: In an area where only 110 foreign-born persons had been X-rayed in previous years, 595 turned out for X-rays after the new approach was tried.

The media for the X-ray educational programs in Wayne County are the local newspapers, leaflets, churches, schools, and home visits, Mr. Reinstein stated. The results of these phases of the program were studied when community attendance to the X-ray mobile truck decreased.

Former Campaigns Studied

Campaigns in 1949 and 1950 in Hamtramck, Highland Park, and Dearborn were evaluated. Graduate students of the University of Michigan Institute of Social Work volunteered to conduct the study. It was found that in all communities the newspapers were the most frequently mentioned source of information, Mr. Reinstein reported. The most effective personal sources of information were the churches in Hamtramck; the schools in Highland Park; and home visits in Dearborn. The only general conclusion was that the campaigns had influ-

Valuable clues in the quest for chest X-ray, Mr. Reinstein said.

Valuable clues in the quest for improving the X-ray publicity in Wayne County were shown to be:

1. A group of 110 foreign-born persons came for their first chest X-ray through direction of janitors of the rooming houses in which they lived. Health department sanitarians inspect the houses regularly and the janitors and caretakers seem to be influential with the foreign-born residents. At the same location during the next survey, 595 of these persons came for X-rays.

2. Persons had stayed away from being examined though they had

been reached. It was found that untrained volunteer workers failed to motivate them.

3. Distribution of leaflets by Boy Scouts was not as effective in one community as home calls by adults which in another locality brought twice as many persons to the trailer.

4. The site chosen for the X-ray trailer was very important.

5. Enlistment of the private medical practitioner and the community dentist is valuable and often the means of local success.

A Pre-evaluation of Pierre the Pelican

Accepting Knutson's principle that evaluation should precede wide distribution of any education material and that a field test constitutes a final criterion in the process of evaluation, Bernard G. Greenberg, M.D., and his associates attempted to find what impact a certain mental hygiene pamphlet would make upon parents of first-born children in North Carolina.

Pamphlets Distributed

The series of pamphlets "Pierre the Pelican" prepared by Loyd W. Rowland for the Louisiana Society for Mental Health was widely distributed throughout Louisiana in 1947. Designed to cover good principles of child rearing beyond the area of physical care, they are, according to the author's statement, characterized by simplicity, cast at the sixth-grade reading level, illustrated by sketches, and comprised of a series of 12 pamphlets, one to be sent out each month. The series attempts to cover topics of interest to young parents, is of optimal length, and makes use of questions for teaching purposes.

The North Carolina State Board of Health, before embarking upon a permanent program of distribution, asked Dr. Greenberg, C. Frances MacKinnon, M.S., and Sidney S. Chipman, M.D., all members of the

faculty of the University of North Carolina School of Public Health, and Mary Ellen Harris, M.S., of the Institute of Statistics at Raleigh, to make a study of the pamphlet's effectiveness.

The study group tried to find the answers to these questions:

In North Carolina, will the pamphlet fulfill the purpose for which it was intended? Will it be equally effective for all demographic groups in the State? Will its effectiveness, if any, justify the cost and effort involved in its distribution?

To answer these questions an experimental and a control group were set up in 17 counties in North Carolina, selected to give a cross section of the population. Pamphlets were sent to members of the former but not to those of the latter group. In a few instances control families obtained one or more issues of the pamphlet. Replies from these families were taken into consideration in analyzing the data, the report explained. A questionnaire schedule was formulated and interviews, arranged for at well-child conferences, were wire recorded.

Reception Favorable

Approximately 2,200 home interviews were conducted with mothers to ascertain through questioning their attitudes and practices regarding infant feeding. While the re-

sults are not clear cut, the data suggest that "Pierre" had relatively little or no beneficial effect upon feeding practices.

"There is no question," the researchers said, "that 'Pierre' was favorably received." Replies to a questionnaire indicate that parents favor continuing the series. In fact, 90 percent of those who answered said they were saving the pamphlets. The preliminary evidence nevertheless raises a serious question about routine gratis distribution of "Pierre" or any similar material, the study group concluded. "An explanation for the apparent failure of 'Pierre' to modify behavior patterns is still not provided."

Pretesting of Materials Increases Usefulness

By pretesting our health education materials in rough form, "we can find out whether they make good sense to persons who have experiences different from our own," said Andie L. Knutson, Ph.D., chief of the experimental and evaluation services branch in the Division of Public Health Education, Public Health Service.

He defined pretesting as a means of obtaining the other man's perception or interpretation of a message



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so that changes can be made to take into account his pattern of understanding and his way of life.

Dr. Knutson cautioned that any pretest technique used should be focused on the reactions of individuals similar to those for whom educational materials are intended. Persons of different economic, social, and educational levels, he commented, vary so widely in experiences, wants, and values that they cannot view all social situations alike.

Tests Identify Barriers

"We have found it useful to plan pretests so that they yield information about potential barriers to effective communication," he said, adding that "pretests will help to identify these barriers," and steps can be taken toward a successful program.

Dr. Knutson pointed to the value of applying objective readability tests and word lists to materials in their developmental stage for determining whether words and concepts have a common meaning.

Members of the intended audience should review the material, he said. Their responses would be helpful in overcoming misunderstandings and obscure portions.

Exhibits and Posters

An exhibit or poster intended for wide distribution should be pretested in a situation similar to the one in which it will be used, Dr. Knutson continued. He suggested that an observer stand with a stop watch some distance away from an exhibit or poster to record how visitors behave during a given period of time: How long do they stop? How does this time compare with the time it takes to view the exhibit completely? What are their comments?

He further suggested a few simple questions to ask visitors as they leave an exhibit: Why did you stop to look at the exhibit? What did you expect to see? What did you find most interesting, least interesting? What would you like to know more about?

Also to be considered, the social psychologist added, is whether people find something in the information to satisfy their wants. But "it is not sufficient for health education to tie in with existing patterns of motivation," he commented. "What is presented must help individuals to achieve health goals with a minimum of disruption of their ways of life. It is unreasonable to expect new practices to be readily accepted if they conflict with deep-rooted habit patterns. At the same time, it is wasteful to re-educate more than is necessary to achieve adequate improvement in health behavior."

Pretests are most helpful when a program is being developed, but they cannot replace exploratory studies nor substitute for sound evaluation, he concluded.

Adult Education Group Defines Interests

The Adult Education Association, comprising specific interest groups and having geographically distributed administrative centers, offers a common meeting ground for those interested in any aspect of adult education, including public health education, declared Fern Long, Ph.D., adult education supervisor of the Cleveland Public Library.

Dr. Long felt there is complete agreement among interested organizations about the ultimate objective of adult education, which is "the development of a citizen body of free men and women, alert to the issues of this time in which we live, informed, thinking, questioning, relating thought to action and action to thought. Indeed, a democracy cannot be viable without that kind of citizenry," she said, but warned that "although the objective may be so simply stated, the achievement of the objective is far from simple."

Information Clearinghouse

This new (1951) organization wishes to be broadly representative

of educational groups, she continued, in explaining the structure of the Association's Council of National Organizations, a group of national organization representatives, including the APHA, which meets periodically for special objectives. The council can be a clearinghouse of information, she said, and, through a news letter to various organizations, a medium for exchange of ideas, materials, and methods.

Organization of adult education on State and regional levels has been made possibly by a 3-year Ford Foundation grant, Dr. Long reported. Conferences will be held to discuss, and explore ways and means of developing adult education on those levels, she said.

"Machine Thinking" Hazard To Health Education

"Machine thinking" was termed by Mayhew Derryberry, Ph.D., as one of the pitfalls facing health educators in their task of persuading people to change their health behaviors.

Dr. Derryberry, president of the Society of Public Health Educators, and chief of the Division of Public Health Education of the Public Health Service, spoke at the second annual meeting of the society.

He cited the frequently encountered mechanical step-by-step directions for organizing community health education programs, which are distributed as a packaged program with accompanying news releases, radio scripts, and posters.

"The machine—the mass producer of progress," as one of our cultural symbols, has already conditioned some of the methods that have been tried, such as the wartime job instructor training, he said. Dr. Derryberry explained that he was not endorsing a haphazard solution of problems but was questioning blind application of rigid mechanical procedures to human beings, personalities, and communities, each

with unique experiences, goals, aspirations, and ways of working.

Administration vs. Performance

A second hazard, he said, is the tendency to be more concerned with administrative structure than with the work to be done.

Communities, he explained, are urged to organize councils of every description, using a specific structural pattern similar to that of some other organization. The structural pattern may include items about membership, representation, administration, committees, by-laws, and so on.

"Any administrative arrangement is acceptable," he said, "if it permits and encourages the health education staff to work jointly and effectively with all other agency personnel in the planning and execution of the program."

Dr. Derryberry named as other hazards, the development of a jargon which has meaning to the profession but not to the laymen outside, use of a familiar technique for widely varying situations, and the tendency among some practicing educators to divert much of their professional efforts into research.

Varied Techniques Needed

The common tendency, he said, is to apply the habitually used techniques to all programs—role-playing, the buzz session, participant observation of group discussions—whatever has been successful in past meetings. Each situation must be analyzed and a method specifically selected or developed to meet the needs, he declared.

Research is needed, Dr. Derryberry said, but the work of the health education practitioner is of equal importance. Persons with native investigative ability should be enlisted for research work, while the practitioner concentrates his efforts on the translation of research findings into action and makes science contribute to the daily lives of people. "It is doubtful," he said, "if the two objectives, basic research

and health education service, can be achieved at a high level of competency by the same individual."

But beyond the hazards are challenges, Dr. Derryberry pointed out, noting that while education has always been employed to some extent in traditional public health programs, "we are now entering an era in which the health problems are such that little can be done of a preventive and palliative nature unless an effective education program gives the people an opportunity to learn their responsibilities." He mentioned as fields that are increasingly looking to educational methods, occupational health, geriatrics, hospital care, vocational rehabilitation, and civilian defense. Among the increasing calls on health educators, he emphasized particularly the challenges and responsibilities in the international health field.

Public Health Personnel Analyzed at Yale

The Yale Public Health Personnel Project, on completion, will provide information on about 6,000 items concerning individual activities, backgrounds, experiences, and working relationships of public health workers, Edward M. Cohart, M.D., of the Yale University Department of Public Health, and William R.

Willard, M.D., of the State University of New York Medical Center at Syracuse University, announced.

The acute personnel shortage, the increasing demand for new services, and the high-rate of personnel turnover in the public health field were among the factors prompting this study. Financed by a research grant of the Public Health Service, it is expected to help provide a partial base for the solution of some of these problems, they said.

More than 1,000 workers in State and local health departments and visiting nurse associations have spent an average of 3 hours at two or more interviews, and about half of them have participated in time studies of 5 days or more. Some voluntary health agency employees were also interviewed through a grant provided by the National Tuberculosis Association. The study has been going on for 2½ years and tabulations and analyses are now being made, they stated.

Concerning health education, the data will provide experimental answers to the questions: What are people in public health doing in health education? What are health educators doing in public health?

"When we complete this study, we should know more about the . . . collective professional lives of health educators and other public health personnel than they do themselves," they concluded.



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Nursing Home Responsibilities Of State Health Departments

Although 46 States have some statutory or regulatory provision for State supervision of nursing homes, much study and research are required in this rapidly expanding field to standardize their establishment and functions. Two papers reviewed the historical background, activities, and the many problems to be solved in nursing homes.

Nursing Homes in Illinois Licensed and Supervised

The public health nurse is an important member of the health department team concerned with the supervision of nursing homes, according to Margaret Ranck, R.N., consultant nurse, Illinois Department of Public Health. In the State health department, she explained, nurses, along with engineers or sanitarians and nutritionists, serve as resource persons and as consultants; in regional and county health departments, they make visits to the homes, give direct counseling to home owners or supervisors, and make recommendations for improvements.

Illinois Act Revised

Illinois has had statutory provision for State licensing and supervision of nursing homes since 1945, Miss Ranck noted. The act was amended in 1951, and the minimum standards, rules, and regulations set up under the act were revised in 1947 and 1952. Illustrating the techniques used in the State health department, she described the methods in obtaining the 1951 revision. Department consultants, she said, pre-

pared a rough draft of proposed revised standards. This was submitted to numerous interested groups and persons—members of the standards committee of the Illinois Association of Nursing Homes, some of the nursing homes, every full-time health department in Illinois, and Public Aid Commission social workers.

"This proved to be a slow but effective way to revise standards," she remarked. "Acceptance, both by the homes and by the health department teams, has been quite encouraging." She believes that future changes in standards should follow a similar pattern of development.

It is with the groups who wish to provide superior services and with the potential home operator that the nurse has her most satisfying experiences, Miss Ranck pointed out. After the necessary preliminary steps have been taken by the State health department and the prospective home operator, a nurse in a local health department visits the prospective home operator to answer questions and to make a tentative decision as to whether the person should be encouraged. Staff, equipment, and program of the proposed home are discussed during this visit. The nurse makes recommendations and sends the State health department an evaluation. A final visit is made by members of the local health department after the home operator makes final application.

Health Department Helps

The State health department helps to improve the care of residents of nursing homes by its work with the Illinois Association of Nursing Homes, Miss Ranck maintained. Public health nurses serve as discussion leaders, as resource persons at

meetings, and as speakers on nursing care. They are presently helping the association develop a nursing home procedure and management manual and are working with it and the University of Illinois in holding semiannual institutes on business management for nursing homes. In regard to the latter, Miss Ranck said that the large out-of-State registration for the current institute indicates the need for public health nurses in other parts of the country to help in the development of educational resources.

Standards, Ethics, Policies Needed in Nursing Homes

"At long last, we in the health field . . . are beginning to face our responsibilities in regard to nursing homes," announced Theda L. Waterman, R.N., M.P.H., executive director of the Central Agency for Chronically Ill, Milwaukee, Wis.

Miss Waterman termed the present situation "not good," and attributed it to the phenomenal increase in the number of nursing homes since World War II and to the lack of experience and preparation on the part of many operators. When most of the 14,000 homes now in existence were set up, she said, there was no one to assist the operators, to give them counseling and guidance.

The operators themselves have realized their need for standards, a code of ethics, and personnel policies, she noted. They are organizing into associations for mutual help and are looking to the nurses, in particular, for guidance and assistance.

One of the first problems that frequently arises, Miss Waterman remarked, is whether or not there should be any attempt to classify nursing homes—according to age of patients admitted, type of care required, type of disease, or financial status. She does not believe in many arbitrary classifications, pointing out that classification might neces-

sitate frequent transfer of patients from one type of home to another or might result in "labeling the patient."

Medical Care Inadequate

"In most of these homes, medical supervision is far from adequate," Miss Waterman stated. Hesitancy on the part of both the patient's family and the home operator to increase the cost of care by calling a physician, failure to recognize the need for a physician, and the frank disinterest of some physicians in cases of long-term illness were pointed out as contributing factors. "There is a need," she said, "for a more systematic and effective plan for sustained medical supervision with periodic evaluation of the patient's condition."

She noted that nursing care is excellent in some homes but cautioned especially against homes accepting patients who need types of services the home cannot give.

Rehabilitation, a service given little attention in the past, can be of real value to nursing home patients, Miss Waterman maintained. She noted that the practice of putting people to bed and keeping them there is bad for the patient and will, in time, burden society with a vast number of invalids. Rehabilitation programs, of course, can be conducted only in homes that provide adequate medical supervision and have adequate nursing personnel, she said.

Central Locations

Miss Waterman also stressed the importance of pleasant, cheerful surroundings in nursing homes and the patient's need for privacy and space in which to keep his "treasured possessions."

Concerning location, the nurse advised that homes be near good transportation, for the convenience not only of the patient's family and friends but also of the personnel. A central location will also help to insure regular visits from the physician, she added.

Business Methods and Standards In Health Administration

The success of a performance budget was reported to the health officers section of the APHA, while the Association of Business Management in Public Health was told how a joint Children's Bureau and Public Health Service account simplified procedures in one State, and how costs of validating categorical grants might be reduced. The combined State public health plan of the Children's Bureau and the Public Health Service was reported to be favored over the separate plans now in use. Performance ratings, work standards, and the function of the nonmedical administrator in public health also were discussed.

Joint CB and PHS Account Simplifies Procedures

Keeping an account which covers all Public Health Service and Children's Bureau funds allotted to Kan-

sas has saved time and simplified accounting procedures and preparation of reports for the Federal Government, Eugene W. Hiatt, business manager and attorney, Kansas State Board of Health, reported.

In addition to the one account sheet for these combined funds, the division of general services and administration keeps a sheet for each of the Public Health Service categorical funds and for funds "A" and "B" of the Children's Bureau, Mr. Hiatt stated. Also, he continued, one account sheet is set up in each division of the health department, showing the total amount of Federal funds allotted to that division, the amount and percentage of these funds which come from the Children's Bureau and from the Public Health Service, and what percentage of the total allotted to the health department by these organizations is represented by these amounts.

Each division in the health department sends to the division of general services and administration a quarterly report of the amounts expended from each fund, he said, and these reports are accumulated and sub-



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mitted to the Children's Bureau and the Public Health Service.

As a result of this procedure, the speaker concluded, only one account is posted in each division, one ledger card shows the amount of funds available in the division from the Children's Bureau and Public Health Service funds, and time is saved in bookkeeping and in preparing monthly budget control reports. The State auditor and the State treasurer, who issue warrants and maintain the account balance, also benefit, since they now have only one account for Federal funds allotted to the health department instead of the eight or nine formerly kept.

Validating Categorical Funds Is Costly

Compliance with Federal reporting requirements for establishing the validity of expenditures of categorical grant-in-aid funds to States is costly in time and in money, Earl O. Wright, chief, division of administration, Ohio Department of Health, maintained.

With reduction of Federal grants to State health departments, the detailed planning of reports, evaluation schedules, and coding procedures to meet the requirements of the Federal Health Grants Manual is becoming increasingly difficult, he said. The restrictions imposed by this manual require the use of more elaborate forms than are necessary for evaluation reports and periodic summaries of activity needed by the State, he continued, and the cost of such reports should be carefully evaluated in relation to the amount of Federal grant-in-aid funds received by the State.

Ways of Reducing Costs

Mr. Wright suggested three ways of reducing the cost of validating categorical grants from the Children's Bureau and the Public Health Service: a 2-year cost accounting project to determine the actual amount of money necessary

to maintain accurate records; State budgets set up according to the State's judgment of their usefulness from the standpoint of the best interests of public health in its broad application, and allocation of grant-in-aid funds on the basis of public health results in the States; reduction of the percentage of funds prescribed by the manual for specialized expenditures and increase of the percentage allowed for supporting services.

The speaker also suggested that the Association of Business Management in Public Health formulate a plan suitable for use by all States, with minor modifications because of variation in legislative requirements, the plan to be submitted to Federal authorities for approval of its use instead of the present expensive machinery required for maintaining accurate records on expenditures of categorical funds.

Combined State Plan Favored in Field Test

In New York, 1 of 10 States in which field tests were made of the combined State public health plan of the Children's Bureau and the Public Health Service, participants almost unanimously favored this type of plan over the separate plans now in use by the two agencies. So stated Irma A. Feldstein, associate examiner of methods and procedures in the office of planning and procedures, New York State Department of Health, in reporting that State's experience with the combined plan to the Association of Business Management in Public Health.

This plan is designed "to provide in one document specific and concise descriptions of plans for public health programs," Mrs. Feldstein said. The report is to be used by the Children's Bureau and the Public Health Service in administering grants-in-aid for public health programs.

The major points which characterize the new plan now in use, the speaker said, are: (1) chapters, or titled plan schedules, designed for reporting specific public health programs; (2) the plan for executive operations, in which the commissioner of health reports his plans for the coordination of all health department activities, for new programs, for special problems and how he plans to solve them, as well as the manner in which supporting services, such as public health education, laboratory, local health services, nursing, nutrition, and statistics, contribute to the over-all operation of the department; and (3) the possibility of substituting plans of State design, provided the substitute plans include as a minimum essentially the information requested on the printed schedule.

Preparation of the Plan

Preparing the plan was a time-consuming task, Mrs. Feldstein stated. The assistant commissioners of health, their program directors, and a representative of the office of business administration reviewed the schedules. The program directors and the director of the office of business administration then conferred with representatives of the Federal Security Agency regional office. Other meetings were held by various groups and combinations of groups before the plan could be completed.

Final reports from all participants were collected, collated, and sent to the regional office, with the commissioner's plan for executive operation. Evaluation questionnaires also were sent to the regional office.

Mrs. Feldstein suggested that when this health plan is put into nation-wide operation the instructions and plan documents be sent to participants at least 5 or 6 months in advance of the return deadline. This will permit more precise planning, better coordination and clearance, more complete review, and assurance of meeting the deadline for its return, she said.

Do Performance Ratings Measure Performance?

Both supervisor and employee have a natural aversion to the service rating as a "so-called scientific measuring instrument in the highly subjective field of human relationships," Henry A. Kjenvet, B.S., director of personnel, Wisconsin State Board of Health, told the Association of Business Management in Public Health. Perhaps no other instrument for improving employee-employer relationships has provoked so much controversy, he said, pointing out that the problem is a "quarrel with form rather than substance."

Evaluation of an employee's performance should be a continuing process and not withheld from him until a specific period of time elapses, Mr. Kjenvet believes. "Formalized service ratings" should be dispensed with entirely, and any type of performance evaluation should be a "matter of importance only between the employee and his immediate supervisor," he also believes.

Noting the official and unofficial decline of ratings, Mr. Kjenvet said that personnel technicians in Wisconsin were seriously considering eliminating the legal requirement for annual employee ratings.

The Federal Government's recent overhaul of its rating system was "defeated before it was ever undertaken," he said, because of the impossibility of developing an objective rating acceptable to employees when it must "carry implied criticisms of employee effectiveness." Assuming that any individual "worthy of his hire is going to be happy over the fact that weaknesses, which he might otherwise feel free to discuss with his supervisor, are going to be made a part of an official record, represents a shocking amount of ignorance of human behaviorism," he said.

Evaluation of Manpower

Mr. Kjenvet pointed out that management has reached high tech-

nological proficiency in its system of checks and balances for evaluating "money, material, and method," but when it comes to measuring skills and individual employee achievement, it inevitably finds itself confronted with a significant area which can render all predictive efforts highly erroneous. "This is the area wherein the ideas, procedures, and techniques which have so painstakingly been developed by one group of human beings rests for their success on the manner in which they are implemented by quite another group," he said. The one basic justification of the service rating rests on its attempt to record an inventory which summarizes the capabilities and skills management has available in manpower, he stressed, but so far, today's technological advances have outstripped sociological advances.

"Individuals in a supervisory capacity who must . . . assess the aggregate of skills available to them so often lose almost completely any semblance of the objectivity which they can and do employ in other matters and render their judgment in an atmosphere of emotion," he said.

Supervisor's Dilemma

A conscientious supervisor is honestly disturbed by two difficult questions, Mr. Kjenvet stated. He must ask "What do I know about the

employee and his work?" and "What evidence is there to sustain my decision?" If he cannot answer, he must resort to some subterfuge. Also, he is frustrated by a genuine uncertainty as to whether another supervisor, in the same department and using the same employee classification, will even attempt to reach his minimum of objectivity, he added. "Thus," he said, "it may be seen that the typical supervisor in the preparation of a performance evaluation report is assailed by certain doubts which can only serve to increase his feeling of indecisiveness and can only generate ultimate antagonism toward a system which places him on the horns of a managerial dilemma."

Operating officials, too, must recognize that the possession of outstanding academic and experience qualifications does not "a priori, mean that they are good supervisors," he said. They will have to concede that despite the errors of personnel technicians, the amount of hostility which has been generated toward the introduction of any method for employee evaluation is hardly commensurate with the magnitude of such errors, he went on. And they must recognize the innate fallibility of human beings which is not "shucked off" when an individual is elevated to the role of a manager of people, he continued. Supervisors



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must no longer "persist in their dogged determination" that their own positions are exempt from scrutiny and evaluation on the basis that that their jobs cannot be definitely evaluated because of intangibles and long-range goals, or because "it would be degrading," Mr. Kjenvet added. "If the intangibles of a job are such as to preclude progress measurement of any sort, then it might be proper to give serious consideration to its abolition," he said.

In personnel management, Mr. Kjenvet said, "we have been all too inclined to attempt to develop our 'systems' within the provincial atmosphere of our own ivory towers," adding that although there were sound reasons, including the apathy and antagonism of operating officials, they were not sufficient to "offset the good which might have been done had we had the patience to educate not only the supervisor but the employee to the importance of mutual cooperation in the development of a sorely needed instrument for more effective management."

Richmond Notes Success With Budget Procedure

The experience of the Richmond, Va., Health Department with its performance budget shows that legislative bodies will appropriate funds for health services when needs are demonstrated and requests are substantiated by comparative service figures.

This was the conclusion reached by William R. Harton, Jr., B.S., administrative assistant in the Richmond Health Department; E. M. Holmes, Jr., M.D., M.P.H., Richmond's director of public health; and former Richmond budget officer, John A. Donaho, M.A., now budget consultant to the State of Maryland.

The Richmond performance budget shows, in both narrative and statistical form, a year-by-year comparison of the programs of work accomplished and the services performed in return for funds appropriated.

Major emphasis, they pointed out, is placed upon work programs and upon the identifiable key factors in the workload—the work units and unit costs—thus providing an opportunity to correlate the annual statistical report with the budgetary process and enabling the health department to systematically and realistically plan programs based on past experience and actual future needs. In the nursing program, for example, the total visits made and the unit cost is a more effective showing than a mere request for total operating funds to be used in purchasing so many supplies and hiring so many nurses, the officials said.

Planning Flexibility

A budget, they stated, is "a plan of work with dollar signs attached."

In the efficient conduct of a modern health department, modern budgetary and accounting systems are the effective tools of management in program planning, they said. Planning flexibility similar to the provision of contingency reserve funds by prudent management is possible with the performance budget because program activities are reviewed quarterly, they pointed out.

"A budget system which emphasizes services to be rendered rather than funds to be expended will result in a more satisfactory and effective health service to the community. This is particularly true if other essentials of a good budget system are present, which would include a modern statistical reporting system, adequate accounting procedures, and, finally, leadership by a competent executive who has a broad and thorough knowledge of the complete operations of the department," they observed.

Since the adoption of the performance budget, programs of home medical care, dental care, housing sanitation, and "acceptance of responsibility for the chronically ill" became new Richmond health services, the administrators said. Prior to the change, in the fiscal period 1947-48, the health department re-

ceived a total appropriation of \$841,728 for all services—a per capita expenditure of \$3.83. By fiscal 1952-53, the appropriation had increased to \$1,494,546, a per capita increase of \$2.66, and an appropriation increase of \$652,818 in 5 years, they reported.

Says Work Standards Are Effective Tool

Performance standards help to develop programs of personnel administration and provide a means of measuring employee performance, Charles B. Frasher, personnel consultant, Professional Examination Service, American Public Health Association, stated before the Association of Business Management in Public Health.

Mr. Frasher defined a performance standard as "that quality and quantity of output which is expected of a worker in a program of public health."

Despite reluctance to accept work standards at certain levels of employment, it is possible to measure output and to develop performance standards for professional as well as for clerical and other nonprofessional workers, the speaker continued. Also, experience has shown that fear of the probable effect on the morale of employees is apparently unfounded.

The establishment of performance standards can be approached in two ways, Mr. Frasher said. In the first, standards are set up so that each person's performance can be compared with that of other individuals doing similar work. In the second, performance expected is the same for all persons, but the past experience, education, job training, and age of each employee are taken into consideration. The latter approach, developing a performance standard for an individual rather than standards for a class of positions, deserves further consideration and probably

represents the most humane approach, he maintained.

Developing Work Standards

The first step in developing performance standards is to determine their desirability, Mr. Frasher said. A committee should then be appointed, with subcommittees representing the various professions involved; later, the lower level supervisors should join the discussions; and finally, all employees should be informed of the project. The speaker said that at some stage of the planning the method of approach should be decided on—whether to match persons against other persons or to match the individual against himself.

When plans have been completed and a decision reached as to the approach to be used, the procedures decided upon should be tested on a small group, to locate, eliminate, or improve factors which are not effective, Mr. Frasher stated. As a last step he suggested that the plan and its results be discussed with other organizations which have had similar experiences.

Administrator's Function In Public Health Noted

How the nonmedical administrator can help health specialists do a better job in public health fields was discussed by an eight-member panel conducted by the Association of Business Management in Public Health. The panel was composed of:

Thomas R. Hood, M.D., M.P.H., executive secretary, Kansas State Board of Health; Herbert R. Domke, M.D., commissioner of health, St. Louis County Health Department; Maude B. Carson, R.N., chief, bureau of nursing, Illinois State Department of Public Health; Jerome H. Svore, M.S., of the environmental sanitation services, North Dakota State Department of Health; David B. Ast, D.D.S., M.P.H., director, bureau of dental health, New York State Department of Health; Robert O. Yoho,

M.A., director, division of health education, Indiana State Board of Health; Albert E. Bailey, Ph.D., director, office of statistics and records, Pennsylvania Department of Health; Irma L. Adams, B.S., director, bureau of laboratories, Missouri Division of Health. J. W. Brower chief, section of departmental administration, Minnesota Department of Health, member of the association, served as the moderator.

Needs Broad Training

Mr. Svore, Dr. Domke, Dr. Hood, and Miss Carson joined in presenting a composite picture of the nonmedical administrator's position.

Although the designation is a negative title, the position definitely involves management duties that bring this administrator into a closer working relationship with the health officer than any other program aide. With such responsibilities, plus the fact that he frequently speaks for the agency, the training and experience of the nonmedical administrator cannot be too broad in the fields of business, public, and personnel administration. He is in the position to contribute to the betterment of over-all administration and thus aid all programs.

In Mrs. Adam's view the nonmedical administrator should take a real part in planning and coordinating activities and bring new techniques and fresh approaches to programs.

Dr. Ast emphasized that if optimum results are to be gained the administrator must know the aims of the program. He cautioned the administrator not to go to unreasonable lengths to determine what is or is not a good program but to rely to some extent on professional opinion.

Mr. Yoho felt that the administrator should remember at all times that the public health program does not exist so that the business manager can function. He emphasized that the administrator, by effectively taking part in small conferences, could indirectly be of great help in the conduct of programs.

Dr. Bailey, also stressing the participant concept, urged the administrator to recognize the need for taking people into more frequent consultation in the planning and the activities touching upon project operations.

Floor discussions centered around the use of the term "nonmedical administrator," the feeling being that the qualification is no longer essential and that such top aides should be called precisely what they are, the administrator per se. The role of the assistant to the local health officer was examined briefly and the need of his help appraised. The panel concluded that this position was rapidly coming to the fore in the team approach to the problems of public health.

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Developments and Policies in Water Conservation

Progress and policies in water conservation were examined from several points of view during sessions of the APHA engineering section. From North Dakota water resource development was seen as a boon to the Nation's strength and to the health of the people. From Illinois came a plea for more extensive use of the interstate compact in the administrative approach to pollution control problems. From Pennsylvania came a warning about increasing demands by industry on usable unpolluted water.

North Dakota Planning Water Resources Uses

When the "Mighty Mo" is brought under control "in the foreseeable future," and full use is made of its waters, the Missouri River Basin will add much to the Nation's strength, in resource development and in better health for the population of the area, according to Jerome H. Svore, M.S., chief sanitary engineer of the environmental sanitation service, North Dakota State Department of Health.

Diversification of Missouri River water can be justified in large measure on the basis of sanitation and public health, Mr. Svore maintained. In some parts of North Dakota available water supplies and water for sewage dilution purposes are insufficient to meet the needs of a rapidly expanding industry, he said. Increased recognition and higher priority placed on water and sewage dilution needs for municipalities and

industry may favor diversion in these areas.

Several dams have been built throughout North Dakota to meet municipal water supply needs, to supplement river flows for pollution abatement during droughts, to provide protection, and to supplement existing water supplies, he added.

Although water needs in the State and sewage loads resulting from municipal and industrial development are comparatively small, impoundment of Missouri River water will necessitate at least primary sewage treatment, the engineer said.

Mosquito Control

Mosquito control in irrigated areas is of major concern to health officials in North Dakota, where encephalitis is apparently endemic, the speaker continued. Studies of species and numbers of mosquitoes have been conducted, as well as an education program for agencies which maintain and operate irrigation systems. In addition, cities and district health departments need assistance in planning and organizing mosquito control programs.

Water resources planning in the Missouri Basin has been greatly aided by cooperation between the Inter-Agency Committee of five governors, the engineer in charge of the Public Health Service River Basin Office in Kansas City, and other Federal agencies, Mr. Svore stated. Full utilization of the water resources of the basin will bring about industrial expansion and population growth, which will necessitate careful watching and control of water resources. As an example of future industrial activity, he pointed to the lignite deposit in the western part of North Dakota which he said has been estimated to be sufficient to supply the Nation's coal needs for 200 years.

Claims Water Pollution Best Solved By Compact

"An administrative approach to the control of interstate water resources and pollution control problems, other than through a Federal agency or one of its creation, is by means of the interstate compact," declared C. W. Klassen, chief sanitary engineer of the Illinois Department of Public Health.

He affirmed that "the States [can] realize and discharge their duties in the pollution control phase of a regional water resource plan; that they can and will [intelligently and reasonably] use this resource; and that, through interstate compacts and agreements, they will meanwhile discharge their duties and obligations to each other while still preserving their sovereignty."

Water pollution control programs should strive to serve adequately the over-all aspects of our entire economic and social environment without emphasizing one aspect to the detriment of another, he said. Waters overused for waste disposal, for example, may not adequately serve for industry, agriculture, water supply, or food sources.

Water usage is part of the foundation on which a practical program of pollution control must be based, Mr. Klassen continued. And the increasing interdependence of regional interests calls for the fitting of State programs into cooperative regional basin-resources plans.

Integration Needs

Successful integration depends upon three factors, he said—the composition, objectives, and policies of the State's control agency; the priority of water usage in the regional basin; and the type of authority exercising jurisdiction over the basin's water resources. He emphasized that full cooperation among all interested public and private groups is necessary to the success of any State or regional plan.

Mr. Klassen stressed the need for

Water Conservation

greater uniformity among the States on industrial waste policies. He recommended that at least 45 percent of the total suspended solids be removed from all sewage and wastes discharged into intrastate waters. Sewage and wastes discharged into interstate waters, he said, should receive the degree of treatment required by applicable interstate agreements.

Since water must serve many varied facets of modern life, "we cannot hope to have an 1852 water environment and quality in a 1952 industrial development," Mr. Klassen continued. Industry, like man, must have usable water in order to survive. However, waste treatment processes often depend upon production methods. As these methods constantly change, so do the solutions to the waste problem, he said.

The States should know what industry is accomplishing in waste treatment, he said, and industry should be ever aware of regulatory requirements or policies affecting it. To be "part of the show," industry should be present "when the curtain goes up," with committees participating in the initial discussions of pollution control by regulatory agencies.

Ohio River Pact

As an example of the integration of State programs into regional, interstate agreements, Mr. Klassen cited the 1948 Ohio River Valley Water Sanitation Compact among New York, Pennsylvania, Virginia, West Virginia, Ohio, Illinois, Indiana, and Kentucky. A commission of representatives of the signatory States and the Federal government was empowered to: make pollution studies; confer with national and regional planning agencies; recommend legislation to achieve the compact objectives; and consult with industries and political subdivisions within its jurisdiction.

By majority vote of the commissioners of a majority of the States, the commission may order the abate-

ment of pollution in any signatory State—provided it is voted for by a majority of the commissioners from the State affected by the order. The latter provision maintains the State's sovereignty, said Mr. Klassen.

He felt that the Ohio River Compact was probably the greatest of this type of cooperative effort ever undertaken by so many States to solve this sort of problem.

Industrialization Presents Water Supply Problems

Industry is making alarmingly increasing demands on the decreasing supplies of usable unpolluted water in the United States, declared R. M. Heister, advanced sanitary engineer of the Pennsylvania Department of Health.

He pointed out that "the total capacity of the treatment plants operated for industrial supplies is imposing. The industrial demand," he said, "is a most important factor which contributes in many cases to the local water shortages . . . discussed so widely over the country."

Industrialization of an area brings greater needs for clean and potable water supplies, he said. Many of the Nation's water facilities are now so overtaxed that new industries are forced to develop their own supplies.

Our population, he continued, has increased 600 percent during the past century and our industrial growth has doubled in the last decade. Water use, however, has increased by several thousand percent and an even greater disproportionate increase in its use is expected in the future.

Unless control and conservation measures are instituted, he warned, the saturation point of water-using industry is not only being approached but has already arrived in some areas. He felt that the problem is particularly acute in the East North Central region of the country.

Abundance Abused

The United States has abundant ground and surface water to supply its needs, Mr. Heister continued, but all areas do not share equally in the abundance. Also, he said, two man-made problems—ground water depletion and stream pollution—aggravate the situation in most industrial areas. In Pennsylvania alone, he stated, over 2,200 miles of waterways are lost for industrial or recreational uses because of acid mine drainage.

The principal industrial user of water is steel, he said, followed by the chemical industry, petroleum products, wood pulp and paper, the coke industries, and others. Many of them have water requirements



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other than volume. For instance, some may require a complete absence of hardness or solid matter while others, especially the chemical industry, need important and specific temperature qualifications in their water for cooling purposes. This requirement, he said, has led to the rapid growth of chemical industries in Kentucky, Texas, and other areas where cold water is available from underground sources, but it also has brought a rapid exhaustion of wells due to industrial overconcentration and heavy pumping.

Mr. Heister emphasized that despite the greatly increased demand for water and the fact that much of it is lost by pollution, the supply does not vary; yet our critical industrial areas may continue to expand by rigidly practicing conservation of available water resources. He recommended the recirculation of process waters, recharge of ground waters, installation of sewage and industrial waste treatment works, development of marine sources of supply through desalting processes, and construction of more multiple-purpose dams.

Progress Cited

As examples of what can be done, Mr. Heister cited, among others:

Experiments by Los Angeles County with an underground "water dam" to prevent the sea from seeping into the deep wells that supply a large part of the water for a half million people.

A reclamation project on the clogged Schuylkill River in Pennsylvania, which for more than a century had been receiving coal silt and debris from the many collieries on its watershed. All of the area's 47 collieries installed treatment works which prevent an estimated 2 million tons of silt and culm from reaching the river and its tributaries annually. Thirty-five million dollars was spent to dredge the river, 75 million dollars for sewage treatment plants, and 75 million on industrial waste treatment facilities.

Planning and Team Approaches To a Better Environment

The team approach to a better environment was the theme of a joint session of the APHA engineering section and the Conference of Municipal Public Health Engineers. It dealt largely with planning, and the problem was looked at in relation to city planning, with regard to the role of the health department, in terms of the contribution of long-range engineering planning, and from the viewpoint of the builder.

In other sessions of the engineers, additional problems requiring planning and appreciation of new environmental conditions were explored, including: defense area problems, use of the membrane filter in aerosol analysis, airborne contagion observations, noise as a factor in health, air pollution studies, the status of sanitary engineers, and sanitation problems of American Indians.

Health Departments Join In Urban Redevelopment

Stressing teamwork and collaborative planning, Edward R. Krumbiegel, M.D., Milwaukee health commissioner, said that the health department can contribute to the success of a "total community housing improvement program," by active participation in neighborhood conservation, rehabilitation, and redevelopment.

Practically all older urban communities are confronted with the decay or blight of certain residential neighborhoods, Dr. Krumbiegel said.

A blight elimination program embraces the protection of residential neighborhoods as yet unblighted, the large-scale improvement and modernization of moderately blighted neighborhoods, and the clearance and subsequent rebuilding of the most severely blighted areas, he pointed out.

Local development of plans for treating blighted areas is a "collaborative job," Dr. Krumbiegel noted, to be done by civic, business, labor, and neighborhood leaders in addition to the official planning agency, the schools, and such typical agencies as public welfare, health, tax enforcement, and redevelopment. The official acceptance of final plans through "appropriate local legislative action" is a necessary and vital step, he said, and collaborative planning assures that the "legislative gap between plans and operative programs will be successfully hurdled."

Role in Housing

Local health departments can contribute to better housing by appraisal of dwelling units, by the organization, education, and motivation to effective action of the citizens living in blighted areas, and by the enforcement of a housing code, Dr. Krumbiegel said.

"The health department, utilizing the personnel of its bureau or division of environmental sanitation, is the logical agency to perform the appraisal of dwellings," he said. Its contribution to effective citizen organization would be in making available "the services of health educators skilled in the techniques of community organization and group dynamics," he went on. Where neighborhood groups cannot effect voluntary correction of undesirable conditions, Dr. Krumbiegel recom-

mended the intervention of an official agency with police authority in the form of a housing code. "The health department is the most appropriate local official agency to enforce such a housing code," he said.

Dr. Krumbiegel recommended two basic studies in the hygiene of housing which the American Public Health Association has already made available to public health administrators: an appraisal method for measuring the quality of housing; and a proposed housing ordinance. He hoped, he said, that the APHA would undertake the development of a guide for educators who may be assigned to operational programs designed to improve the hygiene of housing.

Progressive City Planning Correlates Health Needs

Participation of health officers is indispensable in the planning of better cities, Aimé Cousineau, D.Sc., C.E., director of the Montreal city planning department, declared.

City planning is not limited to a single profession, Dr. Cousineau said, but coordinates the resources and knowledge of the engineer, the architect, the landscape architect, the sanitarian, the jurist, the economist, the demographer, and the geographer.

In Great Britain, he pointed out, the laws relating to town planning and housing have been enacted as parts of the general health laws, thereby indicating the relationship between town planning and health.

The Master Plan

Good city planning, Dr. Cousineau said, requires the cooperation of "the city officials including health officers who have a background of long and accurate knowledge of their community, the citizens' organizations, and the professional planners, whose aim is not only to design but to preserve the beauty

and the amenities of a territory as well. With the aid of these groups, planners can draw up plans or revise them conforming with the highest standards that the science of city planning is able to develop, as they always have in mind that the region, the city, the community, the neighborhood, as well as the dwelling unit, constitute the home and social life."

Dr. Cousineau pointed out that the official plan, or city map, indicates thoroughfares, open spaces, and public utility routes, and pictures present conditions, but the city's master plan is concerned with the future and indicates the trend of future development.

The master plan, he said, "is a synthesis of measures to be taken in order to solve the numerous problems pertaining to the rational planning of a city, to its extension and sometimes to its partial rebuilding. It is a means to an end."

The City Plan and Health

Some of the other statements made by the Montreal city planner relating to public health and city planning are quoted:

On public services—"There is nothing, in either the design or operation of water works and sewage plants, which precludes such architectural treatment of the buildings

and landscaping of the ground as would make the ensemble a definite asset to the community."

On growth—"Any progressive community becomes convinced that the development of its territory can no longer safely be left to take place haphazardly . . . but that such development must be planned to make the best of all opportunities to conserve the values in material wealth and beauty and to enhance public health."

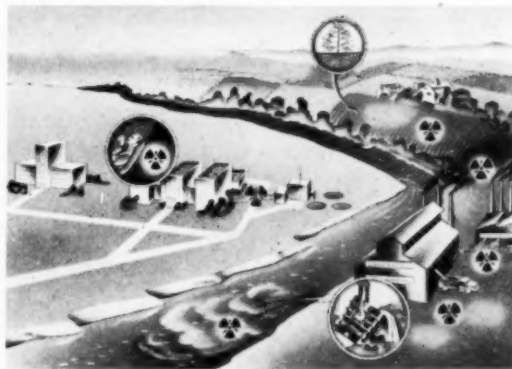
On traffic—"Preventing of injury and deaths from traffic accidents is just as important and promising a field of health protection as many other fields common to the planner and the health officer."

On housing—" . . . the greatest indictment of the present civilization during the past decades was that no adequate environment for living was provided, and this matter becomes a general public concern. This indictment shall hold true in both urban and rural communities, until such time as they will be free from slums."

On zoning—"Zoning not related to a master plan and sound economic policy may cause serious losses. These ordinances must not be arbitrary, discriminatory, or unreasonable but should secure the benefit of their protective features in the conservation of property values."

On recreation—"Open spaces

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which have been found to assure health and happiness and to increase substantially the value of adjacent properties are considered an indispensable element of any city plan, and on this account health departments so concerned in the well-being of the population are always interested in their extensive development."

Home Builders Propose New Face for America

The National Association of Home Builders proposes a "New Face for America" through its six-point housing program, according to Leonard G. Haeger, Washington, D. C., the association's director of technical services and research.

Mr. Haeger described the builder's role in the team approach to a better environment, saying that the elements of good housing are good business for the home builder.

The NAHB program proposes that:

Every community require that all landlords maintain their housing to meet minimum standards of health, safety, and sanitation.

Every community launch a vigorous clean-up and paint-up program.

All dwellings found to be structurally unsafe be immediately condemned and removed in accordance with a city-wide plan.

Where entire areas of a city are found to be beyond repair, the buildings be demolished under city authority and within a complete plan for writing off the cost over a period of years through local taxation.

A direct subsidy plan be developed through local welfare agencies to help people who cannot afford to pay for proper housing. This must be done entirely on the basis of the need. The welfare agencies should insist that contributions will be made only when the family to be helped is in clean, safe, and sanitary housing.

All elements of the housing industry vigorously attack the problem

of providing lower cost housing for rent and for sale.

The above program, Mr. Haeger said, is based on builders' observations about slums: unless the profit is taken out of slum ownership, slums cannot be eliminated; low cost housing can be provided more economically by modernizing old dwellings than by building new ones; slums can't be eliminated simply by tearing down old buildings and replacing them with new ones. "Slums," he said, "result directly from neglect in keeping up the buildings and neglect in training the people."

Advises Advance Planning To Develop Fringe Areas

Many cities have found that some of the problems of fringe development can be avoided by careful advance planning and by establishing as a goal a well-ordered metropolitan community, stated Ray E. Lawrence, Black & Veatch, consulting engineers, Kansas City, Mo.

This goal can be reached, he pointed out, where the city planning commission, either acting alone or with county or township planning commissions, is able to exercise zoning control over an area extending for some distance beyond the city limits.

He suggested that a city can take the following actions toward accomplishing this goal: make a comprehensive study of existing land needs and probably also of future land needs for the populations anticipated for a reasonable period in the future; determine areas which can best be served by water, sewers, and other utilities and which are favorable for development; establish uniform subdivision regulations, including minimum lot sizes; and require all subdivision plats to be submitted to a public utility committee composed of representatives of agencies responsible for providing electric, telephone, water, and sewer service prior to approval of the plat.

He explained that annexation of fringe areas before problems of providing sewer service, refuse collection, fire protection, police protection, and other municipal services become acute is not always possible or practicable.

"The annexation of territory carries with it the obligation of providing the same municipal services which are enjoyed by the remainder of the city," he said. "To provide such services where annexations include large tracts of vacant ground between areas of development would impose a financial burden on the affected property and on the city as a whole. Also, the statutes of most States . . . involve restrictions and legal procedures which limit the extension of city limits."

Defense Areas Aided by Public Law 139

Appropriations made available in 1952 for the administration of Public Law 139 (The 1951 Defense Housing and Community Facilities and Services Act) enabled the Public Health Service for the first time to make loans or grants directly to municipalities for constructing community health facilities, reported M. Allen Pond, M.P.H., chief of the Public Health Service's Division of Engineering Resources.

Mr. Pond said that the Federal Security Agency and the Housing and Home Finance Agency, responsible for administering the act, established a joint policy committee to formulate consistent administrative policies between the two agencies. Also, he said, they make every effort to secure the fullest approval of and participation in each project by appropriate State authorities.

The act makes the Public Health Service responsible for assistance to community projects for facilities such as hospitals and health centers, water purification and sewage treatment plants, and refuse disposal facilities and services. The Housing

and Home Finance Agency assists projects for water source development, water distribution, and sewage collection.

The original Public Health Service appropriation of \$4 million did not provide for assistance to hospitals and health centers, said Mr. Pond. However, a supplemental \$4 million appropriation later permitted assistance to be granted to such facilities. The Housing and Home Finance Agency appropriations have totaled \$20,625,000.

"The program is neither to provide incentives . . . for necessary community facilities nor to compete with private lending sources," he said. "Rather it is to assist those communities which need additional facilities now and which they cannot reasonably provide without Federal financial assistance." The interest rate on such loans is generally approximate to that paid by the Federal Government itself on long-term loans, from 2.5 to 2.75 percent.

Assigns Priorities

The priorities of projects to be aided were assigned as (1) projects without which programmed defense housing could not be built; (2) projects the lack of which would not impede housing construction but without which the health of the community would be seriously jeopardized; (3) projects without which the defense program in that particular area would be appreciably delayed or impaired. Assistance to some projects had to be denied because the act prohibits the use of funds appropriated under it to meet deficiencies existing at the start of the present emergency, regardless of how desirable such projects may be from a public health viewpoint.

Loans and Grants

No funds may be made available to a community, he continued, unless it is in a "critical defense housing area," thereby having a defense plant or installation, existing or proposed; substantial in-migration; and a substantial shortage of housing and community facilities or services.

The "means test" clause of the act places upon the affected community maximum responsibility for paying for projected construction, he explained. Assistance may be given only when it is clearly evident that private borrowing would result in excessive tax or debt burdens for the community. However, determinations of communities' borrowing capacities are difficult to make, he stressed, and the joint committee felt it was not intended that a community completely exhaust its borrowing capacity before Federal financial assistance could be provided.

In some instances, said Mr. Pond, grants rather than loans may be made to municipalities with no assurances of a permanent population increase (for example, extra-cantonment areas or industrial areas with a large but short-lived impact). Otherwise, it would be literally impossible for them to provide facilities when needed, thereby seriously delaying the defense effort. Federal grants or loans on any project may not exceed that part of the facility's cost directly attributable to defense activities in the area and which are not to be recovered by the community from other sources. This limitation prevents the use of appropriated funds for correction of long standing facilities deficits, Mr. Pond explained.

As of October 1952, 208 areas had been declared critical under the provisions of the act. However, said Mr. Pond, of the approximately 70 applications to the Public Health Service for financial assistance, less than 50 came from these designated areas. Mr. Pond felt that the pressure for assistance would have been greater were it not for: (1) a general Federal policy of avoiding the development of new areas; (2) the large volume of public works construction since the end of World War II which was superimposed on the defense community facilities program of 1940-45; and (3) the comparatively sound financial condition of most American cities at the outset of hostilities in Korea.

MF Membranes Applied To Aerosol Analysis

The molecular filter membrane holds considerable promise as an effective tool for rapid and simple sanitary aerosol analysis, reported Alexander Goetz, Ph.D., professor, California Institute of Technology.

In view of the results of investigation to date, he feels that the expenditure of time and effort in a detailed study of the molecular filter's performance for airborne organisms under a large variety of



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conditions, as they may occur in the field, is justified.

The significance of the molecular filter in aerosol analysis is due to physical properties causing a unique retention mechanism which appears to be almost independent of particle size, he said. In his report, he summarized briefly these properties and their utilization. Among the points he mentioned were these: "The internal membrane structure represents . . . an extremely fine submicroscope network of great regularity, of which only the electron microscope reveals a significant detail. The structure, pore size, and so forth, can be controlled over a wide range by the production process."

"Another characteristic quality . . . is a distinct difference of the pore structure between the two surfaces of the sheet. The extent of this difference can be controlled and determines the performance of the membrane significantly. . . . The MF can thus act similarly to a two-dimensional screen, where the flow enters the filter on the side where the pore size is smallest; thus any contact between residue and filter is restricted to the top surface of the MF."

He also discussed the chemical, thermal, and optical properties of MF material and described the equipment for holding the membranes during sampling.

Experiments Described

Reviewing the work of the past 2 years in sampling and analyzing aerosols with MF membranes, Dr. Goetz described typical experiments with pure fumes and with smokes.

Commenting on these experiments, he noted that the performance of MF membranes on smokes can be less effective than on fumes as it depends upon the chemical affinity between the liquid droplets and the surface of the MF material. If the wetting between droplets and MF occurs, the former will be distributed over the inner surface of the latter and, after filling the surface capacity, may be partially redispersed by the outgoing airflow, he explained. However, for

most practical purposes, the retention is sufficiently complete, though clogging occurs sooner with smokes than with fumes.

Dr. Goetz also mentioned various field tests of aerosols through MF membranes. Contemporary with the A-bomb tests in Nevada during May and June 1952, experiments were conducted for the evaluation of radioactive atmospheric constituents, the results of which led to the decision to apply the MF instrumentation and technique used to emergency measures. Presently under way by the Air-Pollution Control Board of the City of Los Angeles is a systematic program for "smog" analysis.

Probably most important from the public health viewpoint, he pointed out, is the evaluation of performance of MF membranes with microbiological aerosols. Concluding his survey, he described examples of the work done in this particular sector, both in artificial aerosols and in the field.

Reports Limited Success In Ventilation Control

Experimental sanitary ventilation has succeeded to the extent that specified conditions of environmental control were fulfilled in control studies, reported William Firth Wells, B.S., associate professor of research in airborne infection, University of Pennsylvania School of Medicine.

Mr. Wells presented the latest 5-year review of progress in dynamic control of airborne contagion. The principle of dynamic control of airborne contagion, he said, was first demonstrated to the American Medical Association nearly a dozen years ago, and earlier, in 1932, to the American Public Health Association.

Participating in the continuing control studies are a number of hospitals, the Great Lakes Naval Training Station, the University of Pennsylvania, the New York State Health Department, the Westchester, N. Y.,

County Health Department, and the Medical Research Council of Great Britain.

Mr. Wells described some of the areas of progress:

Cross-infection was reduced when the air of the hospitals was excluded from, or purified in, operating rooms, burns units, premature wards, nurseries, or children's wards.

Contagious epidemics among school children were slowed down by sanitary ventilation experiments. An epidemic of measles among primary school children was stopped where the disease did not spread dynamically outside the school.

However, sanitary ventilation in schools did not stop infection of school children outside the schools. Where school children were exposed to carriers outside the school, colds were not stopped. Irradiation of a centralized rural school did not prevent the spread of measles through school buses. Irradiation of a village in a metropolitan area did not stop infiltration from neighboring communities.

Acute respiratory disease was a third lower where alternate barracks of a regiment of recruits at the Great Lakes Naval Training Station were irradiated. Though hospital admissions were reduced, infection of recruits quartered in the irradiated barracks by recruits from adjacent nonirradiated barracks was not entirely stopped.

Speech Interference Level May Be Clue in Noise Survey

Noise, it's agreed, can cause permanent and temporary hearing losses, interfere with necessary communication, or just disturb people, three Air Force officers reported. But noise effects below true hearing damage vary with individuals, accustomed environment, and type of sound, they indicated.

Reviewing noise as a health factor were Lt. Col. Alvin F. Meyer, Jr., MSC, deputy for environmental health engineering, Maj. Robert L.

Peterson, MSC, and Lt. Herbert E. Bell, MSC, Office of the Air Surgeon, Wright-Patterson Air Force Base, Ohio.

They reported:

The problem of precisely gauging noise effects is complicated by the widely varying adaptability of persons to noise. Individuals can and do function for long periods in noisy environments without apparent physical harm from the noise.

A community accustomed to occupations in which noise is a factor may accept high noise levels of the same general frequency characteristics. The absence of familiar noise may even be noteworthy. But the generation of sounds with a different frequency characteristic will become bothersome. A loud unexpected sound is more disturbing than expected prolonged noise. And the occasional occurrence of sound, like the drip of a water faucet, has more effect than a steady flow of water.

Noises Are Hazards

Studies conducted at nine large Air Force installations substantiate the observation that unless communication is important, noise below hearing damage levels does not reduce on-the-job efficiency. But noise that interferes with speech and understanding is definitely an occupational and health hazard. Examples are communication problems in control towers, air fields, residential areas with adjacent trains, and places in which heavy machinery is operated.

Temporary hearing loss has been reported at various noise levels. Other studies have shown gradual recovery on removal from the offending sound area. Ear plugs have aided similar recoveries. Partial recovery occurs during the time the patient is home from work, but complete recovery requires 18 to 24 hours. Hearing tests before employment and at intervals during the first few weeks or months can discover a workman's susceptibility to injury by noise. If susceptible, he

may be reassigned or required to wear ear plugs to avoid deafness.

A simplified method of interpreting the results of noise surveys in terms management and the general public can understand is needed. Speech interference level curves offer an excellent tool for engineering evaluation and can be adapted in conjunction with the total loudness of sones to give normal speech interference levels in percentages.

Air Pollution Problem Needs Long Research

"The solution of the problem of the chronic effects of air pollution on exposed populations is nowhere in sight and even the proper techniques are lacking," reported Charles R. Williams, Ph.D., of the Liberty Mutual Insurance Company, Boston.

"The main problems are those of coordination and financing," he continued. Although many outstanding investigations are being conducted in specific related fields, he maintained there is no fully coordinated study of the health of communities having an air pollution problem. He felt that a determination of the role of atmospheric pollutions in affecting the general health of a population will require a pains-

taking and costly research for a long time.

Dr. Williams emphasized that industry is not the sole source of air contamination. The public itself is a frequent primary factor in city air pollution, he said. Automobile exhausts, burning rubbish, smoke from home heating units, and many other individual activities make each person a contributor as well as a victim. However, he felt that more valid standards for permissible levels of contamination could be developed in controlling industrial effluents.

The air pollution problem is complex and extremely confused, Dr. Williams averred. Though it has three principal effects of economic loss, injury to health, and nuisance, occurring singly or together, each problem is unique. Variations in meteorology, geography, industry and populations impede the projection of known results from one area to another. He advocated the establishment of a coordinating agency to act as a clearinghouse and to evaluate results.

Air pollution literature, he continued, is too scattered to keep abreast of all new developments. He recommended a reduced number of published journals in the field and a medium for providing an abstract service.

As a brighter aspect of the air contamination problem, he cited

public health
in transition



TASKS FOR TOMORROW

- Expansion of medical and public health research . . .
- Extension and broadening of health services . . .
- More health personnel effectively distributed . . .
- Better health for the world's millions . . .

progress in analysis methods, resulting in more valid information about the nature of contaminants. He also called attention to advances in the agricultural phase of the problem, reporting investigations of the action of many chemicals on vegetables and livestock.

Dr. Williams felt that air pollution legislation is complicated by the fact that contamination does not stay within local, State, or even international boundaries. Many codes and ordinances prohibit atmospheric contamination in varying degrees, he said, but if some of them were enforced there would be no air pollution problem and probably very little industry. He felt that the lack of information both as to contamination measurement and the actual hazard involved stymies the formulation of practical control laws.

"Unfortunately laws are going to be necessary," he concluded. "We can only hope that the urgency of the problem will not result in bad legislation."

Sanitation Experts Help American Indians

Teams of sanitation experts are helping the American Indians to live in an environment of twentieth century sanitation, according to H. Norman Old, sanitary engineer consultant, branch of health, Bureau of Indian Affairs, Department of the Interior. The tribes have been 50 years behind in using sanitation sciences, he said, adding that a lack of public health services may be responsible.

Mr. Old portrayed a statistical picture of the American Indians' plight: The annual income of a Navajo family is less than \$400; among the Papagos of the Southwest, 25 percent of the infants born each year die within 12 months, and only 48 percent survive to the age of 18. Tuberculosis has a high incidence among all tribes.

The Indians' deplorable living conditions are due to many factors—

poor economic conditions, inadequate educational facilities, illiteracy with respect to the English language, failure to have public health education and sanitation services, and lack of organization among the numerous tribes, Mr. Old indicated. But he called for environmental improvements without awaiting the elevation of the economic status and the needed educational reforms.

A new program is under way, Mr. Old explained. Sanitary engineers, sanitarians, and public health nurses are struggling with the problems of adequate and safe domestic water supplies, excreta disposal, insect and rodent control, food sanitation, and suitable housing. Twelve young men from reservations in the greatest need of sanitation services were selected, in collaboration with the tribal councils, for training as sanitarians among their own people. At Phoenix, Ariz., they received 8 weeks of intensive training in sanitary science by the training division of the Public Health Service Communicable Disease Center. State sanitary engineers and laboratory staffs in Arizona, New Mexico, South Dakota, North Dakota, Montana, and Minnesota are cooperating in demonstration projects. Two public health education specialists are now on duty.

This year the Bureau of Indian Affairs will establish several complete public health units, each with one sanitary engineer and several sanitarians, Mr. Old reported.

Discusses Recognition Of Sanitary Engineers

The full utilization of engineers requires a high quality of engineering training, the establishment of standards high enough to bring acceptance of professional engineering skills by other professions, and initiative action by engineers themselves, asserted W. A. Hardenbergh, editor of *Public Works Magazine*.

"If a man is not an engineer, he should not fill any post requiring en-

gineering skills," Mr. Hardenbergh declared. He felt that an engineer must have completed study at an engineering school and, by suitable experience, have qualified for a license to practice engineering.

In health work, he continued, the health department head generally is not an engineer. But he needs engineering advice in analyzing present and potential problems that should be handled by the engineer, in determining their relative importance, in planning necessary measures, and in fitting this phase of the work into the over-all program. The engineer needs an adequate background for this type of planning and analysis, he said.

He urged State sanitary engineering departments to establish a division of local sanitary engineering, charged with visiting, studying, evaluating, recommending for, and assisting the activities of all local and district health departments employing or needing sanitary engineers.

To promote better community health, he said, sanitary engineers should concentrate on and anticipate the health needs of proposed subdivisions, as well as concentrating on cross-connections, industrial wastes, sewer and water extensions, water quality and new water sources, sewage treatment results, refuse collection and disposal, rodent and insect control, and home sewage disposal.

The sanitary engineer should discuss these problems fully with local health officers, as well as problems of air, shelter, civil defense and disaster planning, said Mr. Hardenbergh. He should offer complete data and recommendations for corrective measures and develop practical working plans for each.

However, Mr. Hardenbergh continued, by using the most effective methods of attack, visualizing his organization and procedures, and being able to direct the work, the engineer can demonstrate the practicability of his proposals within the limitations of available personnel and financial resources.

Standard Methods for Examination Of Dairy Products

The growing popularity of shipping milk by tank truck has presented a new challenge to milk control officials. Other developments in milk control presented to the APHA Subcommittee on Standard Methods for the Examination of Dairy Products included a recommended coliform standard count for ice cream, an adjustment in the quantity of yeast extract for the standard methods plate count of milk, and an evaluation of the direct microscopic method for determining the bacterial count of milk and cream.

Group Weighs Pro and Con Of Shipping Milk by Tank

Alerting milk control officials to the potentiality that future milk shipments may be made by tank truck—from producing farm to pasteurizing plant—Harold S. Adams, B.S., assistant professor of public health at Indiana University Medical Center, presented a preliminary report on the Committee on Milk Sanitation study of the new transport method. During 1951-52, Mr. Adams was chairman of the 10-member committee which reviewed milk sanitation practices in 27 States and the District of Columbia for the APHA engineering section.

"This system has noteworthy possibilities for improving the sanitary quality of fluid milk," he said. "It is interesting to observe that as methods of commerce and industry change, official agencies must likewise revise and reappraise their

control techniques and procedures," he commented. Now practiced most widely in west coast areas, particularly California, the bulk collection system is rapidly gaining popularity in other sections of the country, he noted.

Pros and Cons

The committee listed these advantages to bulk shipment, Mr. Adams said: Elimination of milk loss by stickage and spillage in and from milk cans; elimination of the repair and replacement of milk cans and of the hard labor necessary with the can system; improvement in milk quality because of the more rapid cooling of milk by the bulk method than by can.

Other advantages were noted: The can no longer is a possible contributor to high bacteria count. Milk producers like selling their milk in their own milk houses and can watch the sampling on their own premises. There is less misunderstanding over butterfat tests and bacterial count results.

Another advantage is that the milk company will give more attention to farm sanitation practices because rejecting a tank load is much more critical than rejecting a few cans. In California, for example, Mr. Adams said, a tanker with milk from several producers is considered a single lot at its destination. If the product is not satisfactory, the entire lot is degraded and the receiving plant or purchaser must stand the loss.

Disadvantages of the system were also noted:

From the viewpoint of the control official, more time and travel may be expended collecting milk samples. If samples from individual producers are collected, the sanitarian must

precede the tanker or ride on the truck. In the same time period, samples of milk from many more shippers can be obtained from cans at the plant receiving platform.

The system is generally practical only among producers with sufficient volume to justify installation of costly farm milk cooling and storage tanks.

Sanitation problems can arise if the tank driver is careless in handling milk transport hose or pipe and connections, or if the producer has been careless in his tank and equipment cleaning and sanitizing job.

Unless the milk company employs a well-trained hauler with prior experience in judging milk flavor or odor, milk of "off" flavor might be mixed with the milk of other producers to the detriment of the entire load.

Reports on Experiments With Milk-Free Media

To secure uniformity of results in different milk control laboratories, a dehydrated yeast extract culture medium should be used, Leon Buchbinder, Ph.D., assistant director, bureau of laboratories, New York City Department of Health, suggested in describing his latest study for the Subcommittee on Standard Methods for the Examination of Dairy Products.

Dr. Buchbinder was assisted in the study by Miss Yetta Baris, and Miss Leah Goldstein, bureau of laboratories, New York City Department of Health.

Having noted in earlier studies the relationship of the productivity of a given medium to the quantity of ingredients used, Dr. Buchbinder and his associates sought in the current study to adjust the quantity of the yeast extract used in the APHA standard methods plate count of milk closer to the present Difco standard methods T. G. E. M. medium it will replace.

Experiments were conducted with dehydrated and laboratory-prepared media on pasteurized and raw milk, and with varying concentrations of yeast extract. Comparing four different yeast concentrations in percentages of 0.35, 0.3, 0.25, and 0.20, they found that the Difco Laboratory milk-free dehydrated medium containing 0.25 percent yeast extract, 0.5 percent tryptone, 0.1 percent dextrose, and 1.5 percent agar approximated the productivity of standard methods T. G. E. M. agar more closely than the same medium with greater yeast extract concentrations.

"The concentration of yeast extract seems to be much more critical for bacteria in pasteurized milk than in raw milk," they reported. The difference was attributed to the "fact that pasteurized milk, unlike raw milk, contains bacteria which are injured but not destroyed during pasteurization and which grow in the presence of accessory food substances supplied by the yeast."

The study also assessed a new milk-free dehydrated medium prepared by the Baltimore Biological Laboratory and found it to be an adequate substitute for T. G. E. M. agar. It contains 0.9 percent milk-protein hydrolysate, 0.1 percent dextrose, and 1.5 percent agar.

Coliform Count Standard Urged for Ice Cream

Because coliform organisms in frozen desserts reveal poor sanitary practice, León Buchbinder, Ph.D., assistant director of the bureau of laboratories, New York City Department of Health, recommended revision of the APHA manual "Standard Methods for Examination of Dairy Products" to include a coliform standard for ice cream. At present, it only gives directions for coliform tests, he said.

Dr. Buchbinder spoke as chairman of the subcommittee for the exam-

ination of frozen desserts. He presented the findings of a collaborative study, in which United States and Canadian laboratories and dairy firms participated, to the APHA Subcommittee on Standard Methods for the Examination of Dairy Products.

The subcommittee's findings could be used as a basis for coliform standards, Dr. Buchbinder pointed out. "The present study afforded the opportunity to analyze a group of data assembled from localities distributed over this country," he said, attributing the lack of a standard to the lack of assembled data.

The subcommittee suggested a coliform standard count be set for ice cream "in the region of 10 per ml. with a provision that three of every four samples comply." Of the samples studied, 70 percent revealed a count of 10 coliform organisms or less per milliliter.

Reports on Methods

In its search for the best method of coliform analysis, the research group weighed unmelted ice cream and melted ice cream and compared the yield of organisms from each method. Analyses were also made for flavor, laboratory location, season, and culture medium. Their findings suggest that the coliform counts in ice cream are higher than those in pasteurized milk.

Six conclusions were reached:

Unmelted rather than melted ice cream is preferred for analysis. The use of undiluted ice cream was not satisfactory. The validity of coliform analysis is related to the volume analyzed; the largest quantity tested, 2 gms., gave the highest count. Sodium desoxycholate agar, the one solid medium used, gave significantly higher coliform estimates than did the one liquid medium, brilliant green bile lactose broth. Under conditions of the study, neither season of year, flavor of product, nor type of laboratory seemed to influ-

ence the number of coliforms in ice cream.

Other subcommittee members included Walter C. Bartsch, chief chemist and bacteriologist, Pioneer Ice Cream Division, Borden Co., New York City; and W. A. Cordes, National Dairy Products Co. Leo Habel, records and statistics, New York City Department of Health performed the statistical analysis.

Stains Used in Milk Tests Rated for Efficiency

In a report on the comparative efficiency of six suggested stains for use in the direct microscopic method of determining the bacterial content of milk and cream, Nathan Mantel, B.S., of the National Institutes of Health of the Public Health Service, said that three of the stains were superior and of almost equal quality, one was slightly but significantly inferior, and two were substantially inferior.

A total of 8,352 films had to be counted in the 1951 DMC stain comparison study to obtain replicate bacterial counts from 25 samples each of raw and pasteurized milk and 4 each of raw and pasteurized cream for duplicate counts of the 6 stains by 12 participating laboratories, he said.

A completed report form for each slide counted was sent by the laboratories to Mr. Mantel for statistical analysis. The stains with the highest rank were North's aniline oil methylene blue stain, the acid, water-free methylene blue stain of Levine and Black, and the polychrome methylene blue stain of Anderson, Moehring, and Gunderson. If the average productivity of these three stains is taken as 100, then Borman's experimental stain would score 95, the Newman-Lampert No. 2 stain, 80, and Breed's 23 percent alcoholic methylene blue stain, 75, Mr. Mantel reported.

New Methods in Examination Of Water and Sewage

The following facts, among others, were reported in APHA papers dealing with laboratory and engineering aspects of water and sewage:

Progress is being made toward development of standards for rural sewage disposal systems, and better information is becoming available as to the status of present research—with one such project indicating the suitability of an activated sludge plant for an individual home.

Some of the stricter bacterial quality requirements for natural bathing water could be relaxed without detrimental effects on the health of bathers.

A new refinement in procedures for measuring the coliform population of water samples, and a new method for detecting enterococci in water are reported. Water chemists favor a new method for testing water hardness.

Sewage Disposal Systems Studied for Standards

Presenting the first report of the APHA Committee on Rural Sanitation, its chairman, John E. Kiker, Jr., M.C.E., professor of civil engineering, University of Florida, said the 1951-52 objective had been to gather factual information about progress and status of research on rural sewage disposal systems prior to establishing acceptable standards of design as its next project. Studies by health departments

and university groups are now under way.

Preparatory to the drafting of standards, the committee invited constructive assistance from persons experienced in percolation testing of soil and in supervising subsurface disposal systems. The highlights of the committee report follow:

About half of the homes built today are dependent for their sewage disposal on septic tanks and tile fields.

Where the soil is suitable, and the systems are properly designed, the septic tank-tile field method is satisfactory. It is the best available substitute for municipal sewerage and sewage treatment facilities, but it will not work satisfactorily in areas where the ground water table is high and soil conditions unfavorable. Neither will it work for very long unless the sewage is properly conditioned for subsurface disposal—a function of the septic tank, which must be properly designed for the purpose.

Septic Tanks

Present studies favor a two-compartment septic tank, either of equal compartments or with about two-thirds of the total capacity in the first compartment. It should not be inferred that a well-designed single compartment tank of ample capacity will not give good performance. None of the results to date justify a radical departure from present health department practice. Unless changes would have a marked advantage over present practices, they would only serve to confuse the average builder and add to the worries of the already overburdened sanitarian.

Capacity of septic tanks should be increased by 50 percent when home garbage grinders are used. Absorption fields should be increased by an

equal amount to allow for an increased tendency of sewage containing ground garbage to cause clogging of the soil. There is no evidence that absorption field areas need be increased because of household detergents.

Results of research to date indicate that multiple percolation tests should always be made to determine the absorption characteristics of soil in which tile fields are to be placed. Tests should be continued until soil is saturated and percolation rates are consistent. Standardization and agreement are needed on the size of test holes because of the wide variation in water consumption, but there is doubt as to the feasibility of meticulous refinements of the percolation tests.

Sewage Disposal Plant Can Be Used in Home

A small activated sludge plant has been demonstrated to be suitable for sewage disposal in individual homes, reported Don E. Bloodgood, C.E., professor of sanitary engineering, Purdue University.

Recognizing the need for improved single-home sewage disposal facilities, particularly in rural areas, he explained, a research project was carried out at Purdue University to determine whether the aerobic process might be feasible. The quality of the effluent and the quantity of sludge produced were two of the factors investigated.

Testing was divided into three periods. During the first—399 days—a grinder toilet, compressed air aeration, and fresh water for flushing were used. During the second—100 days—the grinder toilet was replaced with a standard flush toilet. During the third—137 days—a grinder toilet was again used; the effluent, however, was recirculated for toilet flushing, and aeration was accomplished either by compressed air or by admission of air into the recirculation pump suction or discharge.

Treatment Unit

The treatment unit, Mr. Bloodgood stated, was a 227-gallon rectangular metal tank divided into an aeration and a settling compartment. Compressed air was supplied by a diaphragm compressor designed for spraying paint and was applied through a standard carborundum diffuser tube. During the first and second testing periods, the effluent was removed from the sedimentation compartment by a weir made of a split 4-inch pipe and discharged to a floor drain. When the grinder toilet was used, the sewer line leading to the treatment tank was a 1-inch galvanized iron pipe; for the standard toilet, it was a 4-inch pipe.

He reported in detail the data collected on the number of usages, water consumption per use, toilet paper used, pH of the aeration tank, dissolved oxygen, and suspended solids and BOD of the effluent. The mixed liquor solids were not removed until the end of the first month of the second period, when the concentration had built up to 12,000 ppm, he said. At this time, 17 gallons of sludge were siphoned into 10-gallon containers, which remained in the basement where the tank was located. Never at any time did offensive odors develop in the system, Mr. Bloodgood noted.

Small Plant Feasible

From this study, he concluded that:

A small activated sludge plant can be made to operate continuously without odors for 399 days with the production of a satisfactory effluent and without removal of any solids except those going out in the effluent.

Although the minimum size for a tank to serve a family has not been determined, the indications are that a 227-gallon tank is large enough for a family of three.

Grinding the fecal matter and toilet paper is necessary prior to discharge to the aeration unit.

The effluent can be recirculated for toilet flushing without harming the process.

Controls Could Be Relaxed On Bathing Water Quality

"Admitting the difficulties of conducting studies in which nature rather than man controls many of the variables, sufficient evidence is available to indicate that some of the strictest bacterial quality requirements for natural bathing water now existent might be relaxed without significant detrimental effect on the health of the bathers," declared Albert H. Stevenson, M.S.

Mr. Stevenson, deputy officer in charge, Environmental Health Center, Public Health Service, reported on three studies of natural bathing waters and the population groups using them.

The studies, he said, were conducted on (1) two Chicago beaches on Lake Michigan; (2) the Ohio River at Dayton, Ky., and a fresh water recirculation pool in the same area; and (3) the beaches at New Rochelle and Mamaroneck, N. Y., on Long Island Sound. Families in these areas were furnished a calendar record form on which they recorded daily swimming and illness experience. Water quality determinations were made on samples collected from the selected swimming areas at intervals necessary to observe significant fluctuations.

Illness Incidence

Mr. Stevenson, summarizing the results of these studies, pointed out that:

In virtually every instance the illness incidence among swimmers was higher than that among nonswimmers (those not going swimming during the study), an expected finding inasmuch as water is an abnormal habitat for man regardless of its bacterial quality.

In the comparison of illness incidence among swimmers with that among nonswimmers, no significant correlation was observed which could be attributed to swimming in natural waters of different quality at the areas studied.

Illness incidence among swimmers under 10 years of age was some 100 percent higher than for those over 10 years of age.

More than half of the illnesses among swimmers were eye, ear, nose, and throat ailments; about one-fifth were gastrointestinal disturbances; and the remainder were skin irritations and other illnesses.

Specific correlations between illness incidence and bathing in waters of a particular bacterial quality were observed in two instances. In one, a significant increase in illness incidence was observed among swimmers when the water had an average coliform content of 2,300 organisms per 100 ml. over the illness incidence when the average coliform content was 43 per 100 ml. The observed increase could occur as a result of chance but once in 50 trials, Mr. Stevenson said. This evidence, however, should not be taken as conclusive, he warned, since only 3 days were selected for study in each instance.

The second instance of positive correlation was observed in the Ohio River study where it was shown that, despite a relatively low incidence of gastrointestinal disturbances, river swimming water having a median coliform density of 2,700 per 100 ml. appears to have caused a significant increase in such illnesses among swimmers. This result, he noted, must also be treated with great caution because of the small number of cases involved.

Report on Reliability of Coliform MPN Methods

Regardless of cause, variations due to changes in the coliform population of water samples may be accurately measured and the variation due to proper laboratory practice can be measured and controlled by the use of procedures reported by Ralph E. Noble and Marjorie L. Sutherland, Ph.D.

Mr. Noble is the principal filtration bacteriologist of the Chicago Department of Public Works. Dr. Sutherland is a biostatistician with the Illinois Institute of Technology, Chicago. In their studies on reliability of coliform MPN (most probable number) indexes, they combined the standard procedures of statistical analysis variance and the MPN method of estimating coliform population.

Using this method for their calculations, it may be possible for bacteriologists to "have more confidence in their data," they said. They reported that their method makes it possible to check and compare the accuracy of data from different laboratories and that it is also possible to realize that unusual fluctuations in coliform indexes may be due to real causes other than laboratory techniques and to determine the characteristics of the environmental influences which cause these fluctuations.

Methods Used

Using duplicate MPN determinations from the same source is essential to the procedure advocated by the Chicago scientists. Four master samples were collected daily for 25 days, one pair in the morning and one pair in the afternoon, they said.

Questions of accuracy and precision, or "how closely does an MPN approximate the true coliform level of the source," and "how reproducible are the MPN's regardless of their accuracy," must be answered in interpretation of an MPN, the researchers postulated.

As an example, they cited: "Assume the coliform level of a source is 20 per 100 ml. and duplicate MPN's are 17 and 23. A second pair gives 6.8 and 13. The precision is about the same in both cases but the accuracy differs. In the first case the average is identical with the true coliform level, while in the second it is 10 less. Any feature of the method likely to cause a loss or gain of coliform organisms, such as improper storage of samples, would

bias the accuracy of the MPN but might not affect the precision."

In their experiments, a statistical quality control chart for ranges was used to measure the general quality of laboratory technique. They found variation due to laboratory technique to be relatively uniform even though the source population level fluctuated from day to day. Analysis of variance was used to measure the variation characteristic of laboratory replicates from one sample, source replicates, morning and afternoon samples, and samples taken from day to day. They reported that information regarding the variances at these sampling levels can be used as the basis for experimental plans designed to increase the sensitivity of tests in coliform population studies.

New Method Detects Enterococci in Water

A new method for the detection of enterococci in water was presented by Warren Litsky, Ph.D., assistant professor of bacteriology, University of Massachusetts, W. L. Mallmann, Ph.D., professor of bacteriology and public health, Michigan State College, and C. W. Fifield, M.S., Michigan State College.

They explained the two-step procedure as: (1) a presumptive test in a selective enrichment and (2) a confirmatory test in a selective diagnostic medium. The presumptive test is made by planting suitable dilution of the test material in dextrose azide broth (Rothe) for 48 hours at 37° C. Several loopfuls from positive tubes are transplanted to tubes of the new medium, ethyl violet azide broth, which are incubated at 37° C. for 48 hours. Growth in the latter medium is reported as a confirmed positive test for enterococci. *Streptococcus faecalis*, *Streptococcus zymogenes*, *Streptococcus durans*, and *Streptococcus liquefaciens* grow equally well in both media. The media in a series of comparative tests on river water gave a hundred-fold to a thousandfold more entero-

cocci than did either SF broth at 45° C. or Winter-Sandholzer media.

Many Chemists Favor New Water Hardness Test

A great majority of water chemists favor the adoption of some form of the Schwarzenbach method for determining hardness in water as one of the standard tests, according to James E. O'Brien, B.S., senior sanitary chemist, division of laboratories and research, New York State Department of Health.

Mr. O'Brien called the Schwarzenbach method, published in 1946, "vastly superior" to the four methods now listed in the "Standard Methods for the Examination of Water and Sewage." He noted that a committee operating under the American Water Works Association general committee E-5-9 has recently reviewed all the water hardness methods known.

If the committee will recommend either of the Schwarzenbach titrations for inclusion in the 10th edition of Standard Methods is not known, he said, adding that "it is a foregone conclusion" that it will recommend dropping one or more of the methods now listed.

The reagent used in the Schwarzenbach method is the disodium salt of ethylenediaminetetraacetic acid commonly marketed in this country under the trade names Versene or Sequestrene. This chemical is a sequestering agent which holds the calcium and magnesium in solution in a form known as "chelation." "The Schwarzenbach titrations are very precise," the chemist said, "and calcium and magnesium may be determined with a high degree of accuracy provided that certain well-established precautions are observed."

Describing the three known factors which influence the results of this test, he reported that two variations of the original technique have been proposed, both of which have their champions.

School Health Service Trends And Research Studies

Research in school health was the topic of joint sessions of the APHA sections on dental health, food and nutrition, and school health with the American School Health Association. The session heard a report on trends in school health services since 1940, a call for standardizing school health examinations of teachers, a statement that immediate application of preventive measures is a practicable approach to child dental health, a claim that education pays in nutrition, and an account of narcotic problems among adolescents.

Fluoridation Would Help Ease Dental Demands

Immediate application of preventive measures such as fluoridation of public water supplies was urged as a practical approach toward the solution of child dental care problems by George E. Waterman, D.D.S., assistant chief of the Division of Dental Public Health, Public Health Service.

Clinical care alone cannot solve the child dental care problem, Dr. Waterman stated in reporting the preliminary results of a 5-year study completed last year in Richmond, Ind. The study, Dr. Waterman indicated, shows:

There are not enough dentists to care for the backlog of dental defects among the Nation's school children.

Effective work on the part of dental assistants can reduce substantially the workload of dentists.

A vast majority of school children do not get adequate dental care; only 25 percent of those participating in

the program had prior dental attention other than emergency treatment.

The convenience of dental care facilities is a factor in the success of a community dental program.

It takes three to five times as much time and effort to care for the lifetime accumulation of dental needs as it does to cope with these needs on a year-to-year basis.

Timely fillings can save a large percentage of teeth, and adequate care throughout childhood might eliminate most needs for extraction.

The project for care of the Richmond school children in the 16 school clinics was developed by school officials, the Indiana State Board of Health, and the Public Health Service, Dr. Waterman said, stressing that enthusiastic support was given by the local government, the school board, the dental society, and the general public.

Health Services in Schools Show Marked Growth

The number of school systems having health services has increased considerably since 1940, H. F. Kilander, Ph.D., specialist for health education, Office of Education, asserted.

Dr. Kilander reported that:

Ninety-one percent of the school systems in cities with a population of 2,500 and over now have a school health service which includes at least a medical examination and a dental examination.

Physicians are available in 63 percent of the school systems; nurses, in 85 percent; dentists, in 40 percent; dental hygienists, in 16 percent; other health personnel, in 12 percent.

The administrative authority for the school health service program, reported by 2,856 city school systems, is as follows: board of education, 60 percent; board of health, 11 percent; both the boards of education and health, 23 percent; other authority, 6 percent.

The school health service is financed by the board of education in 55 percent of the school systems; by the board of health in 10 percent; by joint financing of the two in 23 percent; and by other authority in 12 percent.

Although the school health program is still predominantly administered and financed by boards of education, there is a slight but definite trend toward joint administration and financing, he said.

Achieve Better Food Habits With Nutrition Education

Given education in nutrition, most elementary school children will form better food habits than eighth graders and high school students, according to Floy Eugenia Whitehead, Sc.D., director of nutrition for the Wheat Flour Institute in Chicago.

Dr. Whitehead referred to the parish-wide diet studies of school children in Ascension Parish, La. These were started in 1944. Records of grades 2 through 11 were used, but no attempt was made to follow the same group of children from year to year, or from grade to grade. All schools in the parish were included.

The speaker reported that an appraisal of food habits made in 1944 revealed the parish school children were not as well fed as they might be. For only 1.6 percent of the pupils could food habits be called "good." Rated "fair" were 59.5 percent. Considered "poor" as to food habits were 38.9 percent.

To illustrate the progressive improvement in diets, Dr. Whitehead presented annual data on the percentage of children with poor diet habits in each grade.

As an example—not more than 5 percent, and often much less, of the youngsters in grades 2, 3, 4, 5, 6, and 7 had faulty diets in 1950. For 1944, in the corresponding grades, the number of children with poor diets ranged between 24 and 44 percent. In the higher grades—8 through 11—the boys and girls with poor diets included between 36 and 49 percent of the students. The percentages varied from grade to grade. But 6 years later, in 1950, the number with poor food habits had dropped to between 6 and 15 percent of the eighth grade and high school students.

Nutrition Education

Nutrition education was planned and put into action by teacher committees who coordinated classroom activities and school lunch programs. Outside assistance came from parish educational leaders and community agencies. Consultants on home economics, health, and education assisted. A full-time nutritionist worked for the first 4 years and returned to evaluate results in 1950-51.

Dr. Whitehead believes that the diet improvements were due to real changes in food habits. "It may be," she remarked, "that during the year children learned which foods were highly protective and that this improvement reflects increased knowledge rather than improved practice."

Consistency in practice was found, however, Dr. Whitehead continued, by comparing diet records with school lunch records. Improvement was indicated by physicians' examinations and by laboratory tests of blood plasma taken from a representative group of high school girls.

The effectiveness of the school nutrition program can be seen in a study Dr. Whitehead mentioned of comparative intakes of food groups. The study, based on standards of recommended dietary allowances, was made in 1947-48 and repeated in 1950-51. It included not only Ascension Parish but nearby St. Martin Parish, where no unusual nu-

trition program had been conducted. Improvement in diets over 1944-50 would be expected as the result of improved economic conditions. Therefore, it was necessary to look at the food habits of children in a comparable situation. Food habits were found to be significantly better in Ascension, yet potential food expenditures were not as high there as in St. Martin during the years of the study.

"If economics alone were the dominant force affecting food habits, one would expect better diets in St. Martin than in Ascension," Dr. Whitehead concluded. "The dominant force affecting improved food in Ascension Parish from 1944-51 was the educational program."

Health of the Teacher Main Factor in Schools

The mental health of the teacher is the most important single factor in the classroom environment, maintained Morey R. Fields, Ed.D., director, bureau of public health education, New York City Department of Health, in his discussion of healthful living in schools.

"The school cannot provide environmental experiences which will contribute to desirable development unless it is staffed with healthy teachers," Dr. Fields stated. "From a negative viewpoint, the unstable teacher exerts such a detrimental impact on children that she should not be allowed to remain in contact with them."

"Effective guidance of children is successful to the degree that it is participated in by teachers with well-adjusted and wholesome personalities," he said, adding that silently, insistently, the dress, carriage, neatness, voice, manner, and habits of the teacher are influencing the lives of the children. No school health impact is likely to be stronger than that of the teacher, for children often learn from daily experience with that teacher.

He listed as other considerations in providing a healthful school environment: position of buildings; size, temperature, humidity, ventilation, lighting, and seating of classrooms; cleanliness; safety of the hallways and stairs; drinking and handwashing facilities; toilet facilities; and sufficient and safe play areas—factors for which standards are available from reliable sources and which can usually be adequately controlled.

"Factors related to human understanding, however, will not respond to laws, sanitary codes, or the architect's drawing boards," he emphasized. "Here, controls are personal, from the mind and the heart," he concluded pointing to areas of bigotry and prejudice permitted to be taught in many schoolrooms.

Adolescent Drug Users Ignorant of Dangers

New York City adolescent drug users in 1950 knew how and where to obtain drugs but were "woefully ignorant" of their ill effects, said Harold Jacobziner, M.D., director of the bureau of child health, New York City Department of Health.

Dr. Jacobziner referred to the rise in narcotic usage among the school age population which reached its peak in May 1951. Between September 1950 and February 1952, the city's school health service uncovered 167 cases requiring treatment. These represented about one-fourth of the drug users in the schools, according to Dr. Jacobziner.

The largest number of users was found among the 16-year-olds, he said, and the rate of narcotic usage was much higher in vocational than in academic high schools.

"Though every racial, ethnic, socioeconomic group and creed was represented, there was a marked concentration in critical areas inhabited by individuals or groups subjected to many deprivations and discriminations, and many came from disrupted and disharmonious homes," he noted.

Narcotic users are in part the products of an unhealthy and unhappy environment so that total treatment of addiction calls for understanding the underlying causes and motivations of addiction, he said. Total treatment, he indicated, would not be limited to medical treatment and follow-up but should aim at the rehabilitation and re-education of the user in a drug-free environment, with full preparation for his return to his former environment. One effective way of preventing the psychological ills leading to addiction lies in a comprehensive program of slum clearance, good sanitation, good nutrition, good housing, and good parent-child relationship, bolstered by a program of good physical and mental health, he added.

Standards Should Replace Examination Variables

Standardized procedures of examining and recording should be developed wherever school health examinations are made by both private and school physicians.

Renée Zindwer, M.D., chief of the bureau of maternal and child health, New Jersey State Health Department, evaluated the method, content, and results of routine health examinations given teachers in the Nashville, Tenn., public schools.

From a survey of 843 Nashville teachers examined by both school and private physicians in 1948, Dr. Zindwer concluded that there were "definite inadequacies in the content of the physical examination," adding that the examining physicians should be informed about the exact purpose and use of the examination and that a close relationship should be maintained with the school service staff.

Annual Examination

Dr. Zindwer suggested that the differences she noted in recording might be due to interpretation—

many private physicians might not have considered corrected vision or artificial dentures to be defects. Some differences might be due to emphasis—for example, school physicians found significantly more emotionally disturbed people, she reported.

Nashville teachers must have a medical examination every summer. Teachers under civil service may be examined at their own expense by a private physician or without cost by the school physician. Teachers not having civil service status must be examined by the school physician. About two-thirds of all teachers had civil service status in 1948.

Dr. Zindwer remarked that "although two-thirds of the teachers had the privilege of choosing their private physician for the examination, only one-fifth actually did so." One motivating factor, she suggested, was expense, "particularly among the older teachers." Many of these still considered the examination as something to submit to exclusively for the convenience of the board of education without recognizing the intrinsic value to themselves. In other instances, she noted, "the examination by a school physician was preferred because of friendly relationships and because the teachers liked to discuss their health problems with the school doctor."

Examination Items

Medical and related information was grouped around 17 items on the routine examination, to include:

Eyes, dental, obesity, cardiovascular, respiratory, orthopedic, gastrointestinal, genitourinary, fractures, major surgery, minor surgery, emotional, tumors, miscellaneous, multiple findings, free, recommendations.

Some of the items, according to Dr. Zindwer, included actual defects predominant at the time of the examination; others were weighted with items of medical history. "Miscellaneous" included a variety of findings not falling into the examination grouping, as—history of dia-

betes, rheumatic fever, allergy, or of multiple miscarriages. For all ages, 12.5 percent of the 843 teachers examined were found to be "free"—without any significant history of disease and showing no defect.

Sex distribution of findings indicated that women had significantly more eye defects, cardiovascular difficulties, operations, and multiple findings than the men teachers, Dr. Zindwer said.

To compare the findings of school physicians and private physicians, Dr. Zindwer explained, "we considered only the teachers with civil service status in order to have a more homogeneous group. Of the 562 people in this category, 148 were examined by private physicians and 414 by school physicians."

Emotional Disturbances

"The higher incidence of eye defects, dental defects, orthopedic problems, and miscellaneous findings as well as of recommendations noted among those examined by school physicians," she continued, "was highly significant and so was the fact that the group examined by private physicians had about three times as many people free from defects or pertinent history as those examined by school doctors. The private physicians also found significantly less emotional difficulties. Altogether, the private physicians' records showed 1.7 positive findings per person, whereas the school physicians noted 2.6 findings per person."

Dr. Zindwer urged that consultant services and special examinations be made available when the routine examination indicates the need for further studies, and that more attention be given to the "importance of detecting and evaluating" emotional disturbances among teachers than is possible through a routine health examination. "We must find a practical method for screening such cases and referring them to specialists for further study and recommendations," she stated.

Studies and Programs In Dental Public Health

Several facets of dental public health received consideration at meetings of the dental health section. The dental care program in New York for the rehabilitation of children physically handicapped; a public program in Rhode Island supported by a private institution, government agencies, and private endowment; the patient-dentist relationship; and the improvement of the status of dental public health were among the topics discussed.

New York Dental Program Treats Malocclusions

Administering the dental rehabilitation program for handicapped children in New York State still presents problems, even after the establishment of apparently sound procedures, observed Arthur Bushel, D.D.S., M.P.H., and David B. Ast, D.D.S., M.P.H., assistant director and director, respectively, of the bureau of dental health, New York State Health Department.

"There is the occasional orthodontist who does not agree with the department's decision as to eligibility of a case, the rejected applicant who feels he is being discriminated against in his request for inclusion in the specialist roster, the judge who suddenly cuts off funds so that even cases which have been under treatment are not approved for essential, continued care. There's the occasional study model broken in shipment, and the child who proves completely uncooperative and for whom care must be discontinued," they said.

One indication of success, they reported, is that almost every qualified orthodontist in upstate New York has asked to participate. The cur-

rent roster of approved orthodontists includes 100 in New York City and 96 in upstate New York. The current caseload of about 1,500 for the entire State represents rapid expansion of the program. Applicants in upstate New York rose from 51 in 1946 to 442 for the first half of 1952, and 54 percent of the upstate cases reviewed in that period were approved for rehabilitation.

Procedures

Continuing their description of the program, they reported that:

Although physically handicapping malocclusion came within the legal provisions of the State aid rehabilitation program, it wasn't until 1945 that a separate orthodontic care program for children was initiated under the bureau of dental health. An advisory committee was appointed to determine, among other functions, fee scales, qualifications of orthodontists, and classification of handicapping malocclusions.

The committee early realized that it could not be too precise in defining handicapping malocclusions because of the infinite number of variations possible and because of the difficulty in evaluating the psychological and physical factors which create a physical handicap, Drs. Bushel and Ast explained. Despite these difficulties, it established the following classifications of malocclusion as to a guide to eligibility:

1. Malocclusions associated with cleft palate, cleft lip, or ankylosis of the temporomandibular articulation.

2. Malocclusions resulting from severe structural deformities involving growth and development of the mandible and/or maxillae: prognathism, retrusion, micro- or macro-development of the jaws.

3. Severe malocclusions resulting from disease or trauma of the mandible and/or maxillae.

4. Malocclusions resulting in disfigurement or speech defects which may present a serious obstacle to normal development, education, and employment of the patient in later life.

Alerted case finders refer detected cases to the local health officer who authorizes consultation with any licensed dentist of the parents' choice. If the case qualifies for rehabilitation, the dentist sends the required diagnostic aids—mounted dental X-rays, full set of study casts, and profile and full-face photographs—along with his written report to the dental bureau for review.

Fees

Under existing State law, the children's courts determine the degree of financial eligibility of applicants for rehabilitation. The State health department has jurisdiction over all professional phases of the program. The county and the State each contributes 50 percent for that part of the care borne by public funds. The local health officer assists the parents in petitioning the children's court for care. Care may be provided only by orthodontic specialists on the health department's roster. No more than 1 year of treatment may be authorized at a time, but up to 3 years may be approved. Usually more than 1 year of treatment is required—the average has been 1.9 years, they reported.

The maximum fee for the first year's treatment is \$300 for service in the orthodontist's office, or \$200 at an approved clinic. Near the end of a year's treatment, the orthodontist submits a progress report to aid the courts in determining if continued care is to be ordered. The maximum fee for each of the second and third years is \$200 for private orthodontists and \$120 for approved clinics. Additional retention care is available at not more than \$5 a visit for a maximum of 12 visits. In all, a maximum of \$700 may be approved for active treatment.

In 1951, 1,105 children received care costing \$246,673 at an average cost of \$223.

Extent of Program

Some of the malocclusion cases require other services such as fillings, extractions, dentures, and obturators, for complete rehabilitation of the mouth. Speech therapy, particularly for cleft palate cases, is obtainable. Children requiring full dentures, extensive partial dentures, or other extraordinary dental service to correct a physical handicap are eligible under the program. The Veterans Administration fee scale is the guide for such general dental services, and any State-licensed dentist is eligible.

It is apparent, Drs. Bushel and Ast believe, that orthodontists serving under the program are "extremely conscientious and certainly are not attempting to prolong the period of care."

Facial Orthometer Is Used To Assess Malocclusions

The facial orthometer, an instrument devised to measure quantitatively the dentofacial morphology of population groups, was recommended as an epidemiological tool for the study of malocclusions by Walter J. Pelton, D.D.S., chief, Division of Dental Resources, Public Health Service, and William A. Elsasser, D.D.S., a member of the division's staff.

This instrument, they said, permits accurate classification, measurement, and controlled experimentation. It may be used to establish the "ideal" dentofacial pattern and also to detect the various deviations from this pattern.

They explained that the term "ideal" is used for the theoretical face whose dentofacial index (DFI) would not only be 0 but whose every measurement would be exactly the same as the standard average for each measurement taken. "Normal" represents the face whose measurements fall within a standard range of the "ideal."

Dentofacial Index

The dentofacial index, they stated, consists of the summation of the weighting of seven separate components. It is thus an expression of the additive effect of several individual variables. To establish the orthometric standard of "norm," the mean and standard deviation for each of five components were determined by observations on 93 "normal" white children, aged 6 through 12 years.

The components which make up the index make possible a quantitative method of classifying malocclusions, they stated. The index provides a useful measuring device suitable for studies of the epidemiology of dentofacial deformities.

When investigations of the incidence and prevalence of malocclusion are carried out on a wide enough scale, a valid concept of the nature and extent of the aberration will be had for the first time, they said. Only through such studies can knowledge be gained as to the effect of various environmental influences on malocclusions.

Finally, they stated, the dentofacial index lends itself readily to use for basic studies of the effects of growth and development upon the face as well as for measuring the changes brought about by treatment.

Combined Resources Used In Dental Care Program

A program for dental care of children combining the resources of separate but cooperating organizations—a private institution, agencies of Federal, State, and local governments, and private endowment, was described, by Alfred F. Morin, D.M.D., the director of the Joseph Samuels Dental Clinic, Rhode Island Hospital, Providence.

The Rhode Island Hospital, a private institution, supplies the physical accommodations for treatment, Dr. Morin said. The cost of dental care

is divided among the patients, the deficit being absorbed by the hospital and the clinic endowment fund. As a result many receive proper treatment without the stigma of having been forced to accept charity.

This subsidized plan, offering families of moderate means dental treatment for their children at small fees, is one phase of the program, Dr. Morin stated. A second phase is the treatment of preschool-age children and education of their parents in the importance of dental health, with funds provided by Federal and State agencies on a fixed cost per visit basis. Provision for dental care of children on welfare rolls is a third phase of the program, financed by city welfare departments, the clinic endowment fund, and the hospital.

The Joseph Samuels Dental Clinic, founded in 1930, in addition to providing community services, has become a center for training dentists in the care of the child population of Rhode Island. Although the program is not the panacea for all dental problems, Dr. Morin believes that dental treatment for children approached from a group basis and formulated into one program with maximum use of existing facilities benefits all participants.

Sociodramas Can Show Stresses of Dental Patients

An understanding of emotional factors, acquired through "role-playing" devices, may help public health and private dentists with human relations problems, William G. Hollister, M.D., M.P.H., mental health consultant of the Public Health Service, believes.

Emotional reactions prevent many persons from receiving needed dental care and, at times, block effective development of public dental programs, Dr. Hollister said.

Dentists, he reported, have requested help in understanding "problem patients," in dealing with the

public's general fear of dentistry, and in getting people to accept and follow through on dental procedures.

From field observations, Dr. Hollister found that most dentists are prepared to educate or to convince by argument. But many of them do not understand how to work with the patient on an emotional level, he said.

Dr. Hollister named as the learning goal the comprehension of the way one's own feeling and the other person's feeling affect a relationship. Pertinent psychological knowledge and enactment of experiences, condensed into a brief workshop or trainee course, can provide this understanding, he said. To illustrate, he outlined a course of this type.

Laying the foundation is a lecture and chalk talk which covers briefly the role of emotional growth in personality development, the component parts of personality, and the physiological basis of emotions. From this material the trainee develops a concept of the basic emotional needs of the individual and how these needs motivate and color behavior.

Reveals Feelings of Both

Through a series of role-playing devices, the trainees experience the "feelings" involved in a dentist-patient relationship. A member of the group, in the role of a dentist, silently approaches a "patient" in a dental chair. And the other members of the group portray their reactions to this "dentist." Thus, they become aware that the role-player, without words, has transmitted to them certain feelings. Through discussion, the group can explore how this nonverbal communication of feelings affects the patient's confidence in his dentist, and the professional person is aided in diagnosing the "feeling problem" with which he is confronted.

Similar "experience techniques" are used to study the effect of the patient's expectations on the relationship, how the "counter-feelings" of the dentist toward the patient

complicate his relationships, and the effect of personality qualities, such as a dentist's warmth and noncritical attitude.

Actual problem situations from the dentist's daily work with people are enacted in sociodramas and discussed. Here the dentist gets practice in working with anxiety, fear, and resistance in a patient before he actually meets the situation. He not only works out the "words" needed, but by experience he begins to sense the attitudes in himself that are basic to better relationships with others.

Improved Dental Status Seen in Proposals

A twofold proposal for securing a better understanding of the objectives of dental public health and, incidentally, improvement in the administrative status of dental units in State health departments was offered by W. Philip Phair, D.D.S., M.P.H., assistant secretary of the Council on Dental Health, American Dental Association.

As the first part of the proposal, Dr. Phair suggested several ways in which dental health directors can help promote this understanding: Foster local cooperative arrangements between dentists and other health professions through joint society meetings and community health work; help in teaching courses in dental public health in schools of dentistry, medicine, and public health; participate actively in health department in-service training programs; demonstrate a genuine interest and good knowledge of other aspects of public health work; write their ideas of what a comprehensive dental health program in their area could be and work energetically and systematically toward achieving it; inaugurate convincing demonstration programs; measure and publicize the effectiveness of their activities.

State Conferences

He recommended, as the second part of the proposal, exploring the possibility of State conferences. "In States where the problem seems immediate enough to warrant specific action," he said, "dental societies could sponsor an all-day conference with participants representing dentistry, medicine, and public health within the State. The conference might also be able to obtain assistance from management consultants, schools of public health, representatives from one or more national organizations, such as the American Dental Association, the American Public Health Association, and representatives of the Public Health Service."

Listed as possible objectives of such a conference were these points: Help acquaint participants with dental needs and resources in the State and the present and proposed programs to meet those needs; establish principles which determine the administrative positions of the respective units in the State health department; seek the establishment of an administrative position for the dental units which will be mutually satisfactory to all concerned and which ultimately will result in better dental public health services for the people; define more clearly the points of agreement and disagreement in regard to the administrative status of the dental unit in that particular State health department.

Recognizing that "blind blames on the medical profession are unavailing" in improving the situation, and that "statements and legislation demanding recognition and status, even if granted, are empty," Dr. Phair expressed the belief also that agreements in meetings composed almost wholly of public health dentists are abortive without demonstration of the fact that dental public health can do a job and without a more concentrated effort on the part of public health dentists in helping their colleagues understand what they are trying to do.

Use of Surveys as Yardsticks In Public Health

The community survey, the professional survey, and the staff self-evaluation study as methods of measurement in public health were discussed in a special session of the APHA. Whether the goal is education of a community about its health responsibilities or measurement of the increase or reduction of a specific health problem, the speakers indicated the surveys were satisfactory techniques, but could be improved by the development of better measuring devices.

Defines Survey Factors To Aid Measurement

In order to establish a common basis for the consideration of public health surveys and evaluations, John D. Porterfield, M.D., M.P.H., director of health, Ohio Department of Health, defined some of the factors involved in public health measurements.

Three Factors

"Need," he said, "refers to the lack of something without which good health is difficult or impossible." He explained, however, that need may not be obvious to the public. For the community population there is instead the factor "want." "And woe betide the health expert who insists flatly on the need for preschool immunization programs when the community wants its children vision-tested," he observed.

"The activity engendered either from needs or wants or from a judicious blending of the two is expressed in 'services,'" he continued. He pointed out that there is a vast difference between the amount of serv-

ices performed and the amount received. Counting the number of doorbells pushed is not quite the same as counting the number of family members who have enjoyed a public health nurse's visit, he explained.

A third factor he noted was community "usage," defined as "the community utilization of a service." Usage alone, he said, is not an accurate measurement of need, for if a community does not "want" the services provided, it will not use them.

Types of Surveys

Mentioning briefly the various ways of measuring these different factors, discussed more fully in succeeding papers, he pointed out that the self-survey by the community very often estimates community "needs" from the viewpoint of "wants." This type of survey, though not highly scientific nor a very exact measurement, is, if properly done, a prime educational tool, he stated.

The professional community survey, on the other hand, usually measures "needs," with only a fleeting reference to "wants," he remarked. He called the professional survey indispensable in developing a pertinent program but suggested that the community may not accept the survey, much less its findings, unless its concern has been aroused.

The professional survey may also be used to compare needs with facilities or services, permitting formulation of judgment as to appropriateness or pertinency of programs, he added. This type of investigation may be requested by the health officer, but more often by the community.

Evaluation or appraisal of public health programs may compare the activity done with the service ren-

dered or the service rendered with the results achieved. "Evaluation is an attempt to determine whether the effects achieved are worth the effort expended or to determine the efficiency of the translation of effort into achievement," Dr. Porterfield said.

Professional Surveys Measure Public Health

Directors of local health departments and other health workers are frequently in doubt about the value and effectiveness of their efforts to improve community health and welfare, stated Ira V. Hiscock, Sc.D., professor of public health and chairman, department of public health, Yale University.

Surveys are helpful in evaluating community health problems and in developing plans to meet them, Dr. Hiscock continued. Administrative surveys include study of organizational structure, review of operating methods, and determination of appropriate areas in which to undertake detailed installation programs. A good survey requires skilled and active staff work, he stated.

"Too much emphasis cannot be given to the need for people with competence to secure and interpret more and better facts in order to show more clearly and precisely what communities can do to prevent and control the problems of the individuals and families," Dr. Hiscock maintained.

When the survey is completed, the professional consultant, "without vested interest or bias," can be of special assistance in interpreting the data collected, he concluded.

Self-Surveys Promote Community Health

The community self-survey of health provides a common ground where professional and nonprofes-

sional persons can meet and work out their problems together, stated Paul A. Miller, B.S., extension specialist in rural sociology and anthropology of the Cooperative Extension Service, Michigan State College.

Sound application of public health practice must involve all members of society, and community health surveys help to shift emphasis from the individual to the family and the community. More and more, participation of local residents in public programs, from planning to tabulation of results, is being encouraged, Mr. Miller said. By taking a look at the health environment in which we live, the recipients of public health services are learning to see their problems from the vantage point of their neighbors, public health workers, physicians, political officials, and others in the public health field.

Community self-surveys of health provide opportunity for instruction and practice in rational, logical, and analytical approaches to the solution of problems. Such surveys reeducate the population of the community and provide an atmosphere conducive to acceptance of the facts about health rather than what is believed to be the facts.

Says Measurement Used Depends on Purpose

Summarizing the preceding discussions on measuring public health, Jack C. Haldeman, M.D., assistant chief of the Bureau of State Services, Public Health Service, said:

"A strong case has been made for each of the methods presented: the community-citizen survey, the professional survey by visiting experts, and continuous self-evaluation by the director and staff of operating health agencies as an integral part of program operation. The time and place for each depends upon purpose. If

a community needs to be aroused to action concerning its health responsibilities, the citizen survey, if properly done, appears to be the most effective education tool. If the goal is scientific measurement of the increase or reduction of a particular health problem, or unbiased appraisal of the administrative efficiency of a health department's organization and management, the professional survey by experts would be the chosen technique. At the risk of overgeneralizing or oversimplifying, one might say that the primary advantage of the citizen survey is to get something started—of the professional survey, to refine what is already in operation."

Dr. Haldeman added that for each type of procedure outlined he would like to underscore the importance of obtaining better criteria as devices for measurement.

"Today's leading public health problems, particularly those associated with the chronic diseases, rehabilitation services, an aging population, and a chemical environment, require a wide range of professional competence and a number of complex facilities and services," he said.

"During recent years," he commented, "we have all become increasingly aware that the newer programs do not always fit into the traditional concept for delivery of public health services. Many local health organizations, as they are now constituted, cannot cope with these problems. This does not mean that local health departments should be strengthened and that new administrative techniques must be developed."

"The answer," he stated, "can only be obtained by determining the real public health needs of the present (as determined by what individuals of the community want and as measured by the experts) and through the evaluation of existing practices to find out how effective they are. Then we can move on to find how they can be improved. The validity of such reassessment of our present

practices is dependent upon the measuring devices we use."

Maryland Study Evaluates Program Efficiency

A study for evaluating the effect of conformance to standards of hospital care for premature infants under way in Maryland was described by Rowland V. Rider, Sc.D., moderator of a panel discussion on measurement of program efficiency.

After outlining the general steps in this type of study, Dr. Rider, assistant professor of public health administration, Johns Hopkins University School of Hygiene and Public Health, described the specifics of the Maryland project:

The standards of care being evaluated, about 90 items, were derived from the recommendations of the American Academy of Pediatrics. Information on the items was obtained at the beginning of 1952 for each hospital by two members of the Maryland Health Department, and a recheck of the hospitals will be made at the end of 1952.

Each of the items of care was assigned a score, and over-all ratings were obtained by adding the scores on each item. The hospitals were then divided into three groups according to these ratings. The neonatal survival rate in each of the three groups will be the measure of effectiveness of conformance to the standards.

In addition, personal data will be collected on each birth and used to compute rates specific for certain characteristics, such as race, in order to control the influence that differences in these factors among the groups of hospitals would otherwise have on the comparability of the survival rates.

Factors Influencing Outcome

In the discussion following this presentation, one of the panel participants, Edward R. Schlesinger, M.D., director, bureau of maternal

and child health, New York State Department of Health, discussed the difficulty in setting up adequate controls in evaluative studies of public health programs and in weighing various factors making for selection of cases in such studies.

In addition to the factors pointed out by Dr. Rider which may affect the neonatal survival rate, the inclusion in such a study of premature infants brought into the nursery from outside the hospital raises complications, he said. Such infants have survived the first few hours and would therefore seem to have a better prognosis for survival than premature infants in general. On the other hand, very small premature infants and infants doing poorly for any reason are usually selected for transfer to the special premature infant nursery. How to balance one factor against the other in any given situation is almost an impossibility, he remarked.

Other Evaluation Methods

Dr. Schlesinger emphasized, however, the importance and possibility of program efficiency evaluation even when it is not possible to do well-controlled and carefully developed evaluative studies. Evaluation, he said, has all grades of exactness, and as long as the limitations of any method are understood, each type is helpful in the development and improvement of public health programs.

The simplest type of evaluation is the comparison of services being rendered against some yardstick established by accepted authority, he noted. In this type of evaluation, there is no quantitative element involved except possibly the extent of the services in relation to the size of the population serviced.

Another type of evaluation mentioned by Dr. Schlesinger was the measurement of accomplishment against previously established objectives. More quantitative, however, is the measurement defined in mortality or morbidity but without any control, he added.

Every society, every community has its quota of those who are handicapped. And modern societies and progressive communities are ever seeking better ways of helping the handicapped to overcome their problems, particularly children, whose problems are still in the formative stage and are therefore more easily resolved.

No matter what the impairment may be—epilepsy, hearing or speech difficulties, or various orthopedic and neurological handicaps—the crippled child can be and is being helped by both public and private agencies. How this help is being effected and appraisals of its success were reported to the APHA, to the National Society for the Prevention of Blindness, and the American School Health Association.

Mistletoe of Yesteryear Gives Way to Mysoline

Since the days when epileptics drank blood of gladiators in the Roman arena and the doctors prescribed mistletoe collected from the oak at new moon, we have come a long, long way in the treatment of epilepsy. This, Ruth Baldwin, M.D., and associates reported in discussing the epilepsy program in public health. The use of the encephalograph in detecting cases, surgery in correcting, and the use of new preparations, such as mysoline, in controlling seizures, give further promise.

Ten characteristics of epilepsy were listed and examined by Dr. Baldwin, pediatric department, Uni-

versity of Maryland Medical School, and her associates, Edward Davens, M.D., chief, bureau of preventive medicine, Maryland State Department of Health, and Virginia Goddard Harris, M.D., pediatric consultant, bureau of maternal and child health of the department of health. These characteristics suggest that the control of epilepsy is a public health problem of high order:

A chronic disease—A lifetime affliction, epilepsy shares with other chronic ailments the problems and costs of securing competent and continuous service.

The wide prevalence—Approximately 1 out of every 200 persons has the disease in some form.

A disease of childhood—Early case finding and provision for adequate treatment are preventive measures of inestimable value.

Few specialized personnel—And these few are located in large medical centers.

The danger of false labeling—Exact diagnosis is difficult without opinions of several specialists and the use of many tests.

The fog of secrecy—This can be dispelled only through public enlightenment.

The need for education of the public—The health department best can spearhead the attack on fantastic misconceptions and shame which surround the disease.

The difficulty in job placement—More than 75 percent of all epileptics are fully employable. In Illinois, 52 percent of 1,450 epileptics have been placed in full-time employment and disposition is pending in 22 percent, leaving only 26 percent in which the outcome is reported as definitely unfavorable.

The staggering cost to society—Assuming that 1 in 10 of the 200,000 epileptics under 21 years of age in

the United States could become self-supporting, the cumulative economic contribution by these restored persons during their working years, whether in earnings or services, would approximate one billion dollars, and a like amount could be duplicated in each generation.

The urgent need for research and training—The singular contrast between the huge annual cost to society and the negligible amounts spent on research and training points up the urgent need for more centers such as the seizure unit of the Children's Medical Center of Boston where a total care program for hundreds of patients annually is carried out along with research and training.

The Maryland Program

What Maryland is doing to combat epilepsy, through its division of crippled children in cooperation with the medical schools, was outlined by the physicians. Regionalization of the State is materialized by dividing the counties to be served between the University of Maryland clinic and the clinic of Johns Hopkins University. A series of regularly scheduled consultation clinics staffed by physicians from the two centers is conducted in 17 of the 23 counties of Maryland. The major aspects of the program are:

Diagnosis and treatment to all from birth to 21 years of age. Observing priority of emphasis, the program has been directed to the large group of children with convulsive seizures—approximately 80 percent—who are readily amenable to treatment and who do not require institutional or custodial care. Approximately 526 children were examined in addition to a number of adults. These children made 1,102 clinic visits during the year. Of the total number, 212 or 40 percent, were brought in to the central diagnostic-regulatory centers for initial definitive work-up and regulation.

Promotion of public understanding that will bring action through coordination with all other public health services—school health, voca-

tional rehabilitation, citizens' groups such as mental hygiene societies, and crippled children's programs.

Among many case histories cited in the report was one illustrating the part played by psychiatric consultation in arriving at accurate diagnosis and in curing simulated epilepsy. Interviews with the child's parents, who were divorced and remarried, indicated the child was simulating seizures she had witnessed in others. Excellent adjustment followed treatment and placement in a foster home.

Delaware Agencies Unite To Aid Speech, Hearing

An interlocking program to correct the speech and hearing defects of preschool- and school-age children unites Delaware's State Board of Health with the Delaware Hospital and two school systems in a common service, Jack Sabloff, M.D., and L. Leroy Horne, M.A., told the joint session of the maternal and child health section and the American School Health Association.

Dr. Sabloff and Mr. Horne are directors, respectively, of the division of maternal and child health and crippled children's services in the Delaware State Board of Health, and of the Delaware Hospital audiology and speech center, Wilmington.

Workable procedures and a clear-cut understanding of each agency's and individual's part in the program are essential to its smooth running, they said. They described the program as follows:

Schools

Delaware has two public education systems, one in the State and the other in the city of Wilmington. The city, in 1943, initiated a speech correction and reading program which, with a staff of four speech correctionists, a speech reading teacher, and a teacher of the deaf, serves 12,000 children. All other schools except parochial schools are served by the State's

speech and hearing program. Its supervisor of special education and six speech correctionists are responsible for the speech problems of school-age children.

The two systems act for the health department as case-finding agencies, relying on the teacher-nurse relationship. Any child suspected of impaired hearing because of speech deviation, inattention, or history of ear infection is brought to the attention of the speech correctionist for a pure-tone audiometric test. If correction is indicated, he is referred to the State board of health for complete audiologic and otologic evaluation. The family physician is notified of the referral by the school nurse.

Board of Health

The State board of health employed a speech therapist for cerebral palsied children in 1946. Children with cleft palates and others with functional speech disorders were later included in the nucleus of a speech program stressing services for preschool youngsters. As speech problems related to hearing impairments were encountered, the program was expanded to include hearing. A coordinator of speech and hearing, three additional therapists, and an audiologist compose the staff. Diagnostic services and speech therapy are available. Almost all cerebral palsy cases and most cleft palate cases are referred by the schools to the health board. The staff conducts therapy at scattered county health units.

Children are referred to the Delaware Hospital audiology and speech center for otologic and audiologic evaluation and for such recommended treatment at the hospital as tonsillectomy, adenoidectomy, and radium and X-ray therapy. When auditory training, language, and speech rehabilitation are indicated, the board of health utilizes the audiology and speech center for Wilmington children. Children in other parts of the State are trained by its own staff audiologists.

Audiology Center

In 1949, Delaware Hospital started a department of audiology and speech and an audiology center, equipped by the State board of health. The hospital arranged for the center's construction and agreed to support the center and its staff, which is directed by a member of the hospital's department of otolaryngology. The health board set fees and in-patient hospital rates with the hospital. The center's hearing services were expanded in July 1951 to include all speech deviations.

Equipment includes a modern speech-hearing evaluator and an electronic device for psychogalvanic skin resistance testing. Diagnostic audiometric tests and speech-hearing threshold and discrimination testing are performed. Speech and reading therapy, auditory training, counseling, and mental hygiene round out the complete rehabilitation services available. Hearing aids are scientifically selected and evaluated. Complete otolaryngological examinations and treatment and surgical services are provided for health board referrals by the hospital-assigned otologist. The center is staffed by two persons professionally trained in audiology and speech pathology.

Training an Essential In Hearing Programs

Two pitfalls that a public health program for speech and hearing must avoid were noted by Leo G. Doerfler, Ph.D., associate professor of audiology, University of Pittsburgh School of Medicine.

Dr. Doerfler said too much emphasis may be placed upon diagnostic work and sufficient provisions may not be made for adequate follow-up and training. It is not enough, he declared, to demonstrate that the small amount of hearing still remaining in a hearing-handicapped child of

preschool age, for example, can be utilized to pay later dividends psychologically, educationally, and vocationally. If the program does not provide facilities and trained teachers to take advantage of this fact, little has been gained.

Diagnosis involves differential diagnosis of children who do not respond adequately to sound, he continued, not to just a hearing test. He suggested the use of many simple toys and tools in addition to the audiometer and, where feasible, newer instruments such as the psychogalvanometer. All special tests require special interpretation, he pointed out. Moreover, there are vital diagnostic facts, such as parent-child relationships, which are not revealed by any machine, he added.

He also urged, as a correlate to this problem of diagnosis, that recommendations for training and education be realistic. Until facilities are improved and enlarged and new ones opened, raising hope that cannot be practically realized does more harm than good, he maintained.

Hearing Tests

At the preschool level, Dr. Doerfler stated, there are reasonably accurate small-group tests which may determine whether or not the child has sufficient hearing to hear and understand normal speech. Recorded speech is usually the test material, and the responses required are actions rather than speech.

The trend in screening tests for school-age children is toward use of pure tones, administered either individually or to small groups, and away from the use of the phonograph audiometer using words or numbers. Pure-tone tests give more information, are more efficient in case finding, and are about equal in terms of time for administration.

Hearing measurement tests listed included the following: audiometric tests, usually for children above 5 years of age; tests, electronically administered, to determine whether

speech is understood; and special tests, including the so-called conditioning tests. The latter group have much to offer, he remarked, especially for testing children under 3 years old, but much is yet to be learned about validation of the various clinical types before the tests can be employed universally.

Ohio Extends Program To Conserve Hearing

A goal of the Ohio Health Department is to test annually 33 percent of the school population for hearing defects," Margot D. Hartmann, M.D., M.P.H., chief of the division of child hygiene, Ohio Department of Health, reported to the joint session with the American School Health Association.

Five years ago audiometric testing was practically unknown in the smaller school systems of Ohio, the speaker said. Although there was only a 7-percent increase in the total number of school children tested from 1947 to 1951, she stressed that pure-tone audiometric tests were given to 87 percent of all tested in 1951 as compared to 38 percent in 1947. The number of counties giving some kind of hearing test increased from 46 to 81 (out of a total of 88), and the number of cities which include a hearing test in school health programs increased from 31 to 65, she stated.

Local Resources

Local resources are the core of the State's demonstration program, the speaker continued. They are used in planning and audiometric testing, and local specialists are used in rural communities wherever possible.

The coordinating agency for local program planning is the division of child hygiene in the State health department, Dr. Hartmann reported. Highly qualified consultants advise local health departments and schools, maintain liaison with other State agencies, universities, and profes-

sional groups, and assist with testing and interpretation at clinics. Locally, the program is centered in the health department, and emphasis is on prevention and education, she reported.

Training of local personnel is supervised by State consultants, or may be a shared responsibility of State consultants and local speech therapists. Testing methods used must conform to established standards.

Value of Clinic

Although the testing program will show whether or not a clinic is needed, the health department usually requests a clinic to demonstrate the value of adequate diagnostic services, Dr. Hartmann said.

Programs are started only on community request, the speaker said; quality of service, not quantity, has been emphasized; hearing conservation programs were encouraged only when local interest and personnel justified it; follow-up of a few children and correction of all defects found was of first concern. Follow-up care of children examined in clinics or referred to the clinic directly is the responsibility of the community, she stated.

Use of Trailer

A trailer which permits all types of audiometric tests, hearing aid evaluation, and speech reception, has been put into operation, Dr. Hartmann stated. It has been used chiefly in mass education at county fairs, the State fair, and meetings of professional and civic groups. About 3,200 persons of all ages were tested at fairs this summer and referred to physicians if they did not pass the test, she reported. The trailer can be used for vision testing.

Ohio provides scholarships to four to six postgraduate students in audiology, Dr. Hartmann said. Scholastic ability and seriousness of purpose are the only requirements for eligibility, she concluded.

Visual Screen Methods Studied in St. Louis

Discussing the organization of a vision testing research program, Marian M. Crane, M.D., chief of the Children's Bureau child development research branch, reported the following:

The study was carried out jointly with the National Society for the Prevention of Blindness, the Children's Bureau of the Federal Security Agency, the Missouri Department of Public Health and Welfare, the St. Louis Board of Education, the department of ophthalmology, Washington University School of Medicine, and the Office of Naval Research, from February 1948 to June 1949.

Aim of Test

The purpose was to determine the efficiency of some of the procedures frequently used for screening elementary school children for visual defects as measured by the success of the procedures in identifying those students found by ophthalmological examination to need eye care.

Subjects were 609 sixth grade students and 606 first grade students in 14 public schools in St. Louis. Each student received a complete ophthalmological examination which included refraction under homatropine cycloplegia. On the basis of the findings one ophthalmologist recorded a clinical judgment for each child: "refer" if the child needed observation or treatment because of his eyes; "nonrefer" if special eye care was not needed.

The screening procedures studied were teacher observation, the Snellen test, a test of visual acuity at 14 inches using selected lines from the Lebensohn chart for sixth grade and from the Guibor chart for first grade, the Massachusetts vision test, the Keystone View Co. telebinocular, and, for sixth grade students, the American Optical Co. sight-screener and the Bausch and Lomb orthorater.

Methods

Each student was given all of the screening tests (except teacher observation) by each of two testers: a technician who tested all students in the study and the nurse for the school the student attended. In addition, each student was given a Snellen test by his classroom teacher. The amount of preliminary training given these different testers varied and was planned to simulate the amounts that, in a school vision testing program, it would be practical to provide for one tester for many schools, one tester for each school, or each classroom teacher.

The clinical examination and the various tests were administered in randomized order so as to minimize the influence of any learning factor.

A referral by a screening procedure of a student classed as "refer" by the ophthalmologist was considered a "correct referral." Referral of a student placed in the "nonrefer" category by the ophthalmologist was considered an "incorrect referral."

School Nurse Has Job In Vision Testing

The function of the public school nurse in the vision testing research program in St. Louis, Mo., was reported by Annette L. Gronemeyer, R.N., of the St. Louis Board of Education's division of health and hygiene.

Each nurse selected for the eye study was given special instruction regarding procedures and instruments and tests to be used. After being tested with 18 practice cases under supervision, she then was not corrected or assisted unless she asked questions.

Children were tested with glasses if they wore them, and if they wore them only for special purposes they were tested accordingly. Children with defective vision were subject to follow-up routines, in which Miss Gronemeyer reported complete and appreciative cooperation by parents.

The Classroom Teacher Conducts Tests

The procedure in the St. Louis vision testing study is one that any classroom teacher, in the absence of a trained nurse, might use as a preliminary screening, Lula Hack, elementary teacher in the Bryan Mulvanphy School, reported. In the study teachers aided in convincing parents of the tests' importance and no children were tested whose parents failed to give consent, Miss Hack said.

Preliminary instructions for participating teachers were given by Dr. Marian M. Crane of the Children's Bureau. Later the teachers received directions for administering the test. Just prior to the actual testing, they were trained by a nurse consultant in the use of the eye chart and the technique of recording observations.

Snellen Test Used

In giving the Snellen test the teachers followed directions of the Massachusetts Vision Test for Elementary Schools. A special biographical form was filled out for each child. For children unable to read, Miss Hack suggested that teachers devise a simple child's game based upon the testing procedure to put the children at ease and to show them how the "fingers" point on the "E" chart.

In giving the tests, the teachers worked independently without coaching and without supervision. All corrections of errors and entries of omissions were made by the teacher, any part of the test being repeated if necessary. Individual tests required 2 to 3 minutes.

A successful teacher must be constantly alert to detect any sign of difficulty that might hamper the child in learning be it impaired vision or impaired hearing, Miss Hack concluded. Having found it, immediate correction or elimination is imperative to the child's well-being.

Laboratory and Field Advances In Food Sanitation

Newer developments in food sanitation and laboratory measurements were discussed by the food and nutrition and laboratory sections, and the problems examined from a variety of angles. It was reported that crushed ice is likely to be of low sanitary quality, that enteric pathogens and coagulase-positive micrococci can be identified in 2 days, that efficiency levels of selenite enrichment broth must be watched. A 4-step test for bacterial contamination of dishes was outlined to a subcommittee; and the engineering section told of the use of isotopes in dishwashing experiments.

Antiseptic Powdered Soaps May Benefit Workers

Industrial use of powdered antiseptic skin cleansers may bring about increased bacteriostatic protection as well as a greatly reduced transmission of communicable disease by skin contact, according to experiments conducted by M. Martin Maglio, Ph.D., chemical director, and John M. Hannegan, Ph.D., manager, respectively, of the industrial skin cleanser division, of Vestal Laboratories, Inc., St. Louis, Mo.

Since the development of effective germicidal bar and liquid soaps, the desirability of incorporating a germicide into industrial cleansers has long been recognized, they said. The industrial worker would thus be less subject to dermatitis, boils, and carbuncles, they said.

In their experiments two antiseptic powdered skin cleansers were prepared, one with a percent hexa-

chlorophenyl, the other with bis-(2-hydroxy-3, 5-dichlorophenyl) methane. A powdered cleanser duplicating the antiseptic ones except for the germicide was used as a control. An ordinary home bar soap was used for comparison. A liquid antiseptic soap containing 2-hexachlorophenyl, standard in many hospitals, was used for comparative purposes.

Washing was carefully controlled. The Cade multiple-basin was the basis for the method used. Rinsings in each basin were sampled, plated, incubated, and the number of colonies present were determined by a Quebec colony counter. The low bacterial counts obtained were clearly not due to bacteriostasis, they stated. The antiseptic liquid soap and the two germicidal powdered cleansers were found equivalent in their effect. The powdered cleansers were 60 percent more efficient than the unmedicated duplicate.

Selenite Broth Media Vary in Efficiency

Greater emphasis on the need to determine the efficiency of selenite enrichment broth is necessary whenever new batches of the medium are to be used or when a change is made in the character of the inoculum, according to W. R. North, B.S., and M. Thomas Bartram, Ph.D., of the Division of Microbiology, Food and Drug Administration.

Deficiencies in the productivity of selenite broth for recovery of *Salmonella* from pure culture and from egg products have been noted, both in commercial products and in media prepared in the laboratory from different types or batches of peptone, they said.

In the isolation of *Salmonella* from egg products, these deficiencies may be overcome in part by the addition of the substance under examination, they stated, and adding cystine in a 10-microgram-per-milliliter concentration further lessens the deficiency in productivity of the broth. In examining substances which do not contribute to the nutritional character of the medium, similar additions of cystine are essential.

Adsorption of Bacteria Hampers Dishwashing

Normal dishwashing methods will dislodge only a small fraction of some types of organisms strongly adsorbed on eating utensil surfaces, reported Gerald M. Ridenour, Ph.D., associate professor of engineering, and Edward H. Armbruster, research associate, University of Michigan School of Public Health.

The researchers investigated the bacterial cleansibility of glass, china, steel, plastic, and aluminum, using P³² tagged bacteria, and measuring by the radioactive count method. Their studies covered the relative retention of different bacteria on different type eating utensil surfaces, different conditions of surfaces, absence and presence of organic soil, and soil film build-up resulting from repeated soiling and washing.

Adsorption Characteristics

Other results of the experiments follow:

The strength of adsorption varies with type of organism: some are lightly adsorbed, others strongly. Adsorption of the organism is specific for a surface.

Of the organisms studied, *Micrococcus aureus* was the most difficult and *Escherichia coli* the easiest to remove from a given surface.

In the absence of soil, percentage removal of *M. aureus* from china, glass, and steel surfaces, with standard detergency and temper-

ature conditions, was between 97 and 99+, but between 56 and 84 on plastic and aluminum surfaces. The large variation noted on plastic eating surfaces did not exist among china or glass surfaces.

With *E. coli* in the absence of soil, ease of removal increased for all surfaces, varying between 99 and 99+ percent for china, glass, and steel, and between 90 and 98 percent for plastic and aluminum.

When the bacteria were mixed with an organic soil, the efficiency of removal increased markedly for all surfaces. When the bacteria were overlaid with the organic soil, efficiency of removal from plastic surfaces dropped quite markedly in relation to china, glass, and steel.

When plates were worn or scratched, removal efficiency decreased for all surfaces, but the same relation existed between different surfaces as with the unworn surfaces.

4-Step Method Measures Dish Contamination

Additional experimental work in determining the bacterial contamination of dishes was described by Albert F. Guiteras, Ph.D., director, Hudson Laboratories, Inc., New York; Lawrence H. Flett, B.S., director, new products division, national aniline division, Allied Chemical and Dye Corp., New York; and Rebecca L. Shapiro, chief bacteriologist, Hudson Laboratories, Inc.

This method, the authors reported, is designed primarily for research work and for routine regulatory health control purposes. It involves four steps: (1) placing the dish to be examined as a cover over a Petri dish containing melted tryptone glucose extract agar at about 45° C.; (2) inverting the two dishes so that the Petri dish is on the bottom; (3) allowing the agar to harden at room temperature; and (4) incubating the set-up for 48 hours at 37° C. After incubation the dish is removed, leaving the agar in the Petri dish

where the colonies are counted with the aid of a Quebec colony counter.

The authors reported two experiments using artificially contaminated plates. A comparison of this method with the swab contact method revealed that the total number of organisms recovered by the new method was quantitative, within the limits of experimental error, whereas the number recovered by the swab contact method was significantly lower, even with the use of two swabs.

Series of Tests Reveals Crushed Ice Is Unsanitary

Ice as dispensed at many eating establishments is of extremely low sanitary quality, V. D. Foltz, M.S., Kansas Agricultural Experiment Station, Manhattan, Kans., stated in a report on a study of 114 samples collected from hotels, restaurants, soda fountains, and hospitals in central Kansas.

Presenting detailed results obtained from physical and bacteriological examination of crushed ice and of cubed ice from automatic ice machines, Mr. Foltz reported that:

Only 27 samples were of acceptable quality, using absence of coliform as the criterion of potability.

Of the 77 samples of commercial crushed ice, only 10 were free of coliform organisms, indicating gross contamination during grinding, sizing, bagging, and delivery to the consumer, since samples of cake ice from which crushed ice is made were found to be entirely satisfactory.

Of 37 ice-cube samples, 17 were coliform negative. Ten of these samples were collected from hospitals, and all were negative for coliform and clostridia, demonstrating that ice-cube machines can be operated in a sanitary manner and the product dispensed in good condition.

Of 32 ice-cube samples examined for micrococci and streptococci, 22 contained the former and 19 the lat-

ter; these organisms were found in only one of the 10 hospital samples.

Inert material found in the samples included sand, clay, assorted colored fibers, assorted colored thread, vegetable fiber, fingernail-polish scales, insect fragments, rodent hairs, human hairs, and wood splinters. Although this material is not a direct criterion of bacterial pollution, it indicates the extent to which the product may have been polluted, Mr. Foltz remarked. The ice-cube samples were remarkably free of dirt, the hospital samples containing the least amount.

Rapid Coagulase Method Equals Routine Test

A survey among 341 food handlers to determine the carrier rate of coagulase-positive micrococci revealed that 73 (38 percent) of the 191 males and 56 (37 percent) of the 150 females examined were nasal carriers of this causal agent of staphylococcal food poisoning, reported S. J. Millian, M.S., H. H. Weiser, Ph.D., J. M. Baldwin, Ph.D., and J. M. Birkeland, Ph.D., of Ohio State University's department of bacteriology.

These carrier rates, determined at the university's dining halls, are 5 to 10 percent less than those reported by investigators of other groups, they said, and were found to be unaffected by the age or sex of the food handlers.

A study of the distribution of penicillin-resistant coagulase-positive micrococci was also made. Twenty-seven percent of the male and 23 percent of the female carriers were found to harbor penicillin-resistant strains.

A new method was developed which can detect carriers of coagulase-positive micrococci within 24 hours. After sampling, the nasal swab is put into a 12 ml. centrifuge tube containing 5 ml. of BHISB (brain heart infusion salt broth) and is incubated at 37° C. for 20

hours. The broth is then centrifuged, the supernatant decanted, and 0.5 ml. of fresh citrated whole rabbit blood is added to the packed cells. The suspension is thoroughly shaken and transferred to agglutination tubes which are incubated in a 37° C. water bath for 3 hours. The contents of the tubes are then observed for coagulase activity.

The efficiency of this accelerated method, they said, was comparable to the routine procedure using sheep blood agar and lactose salt agar.

The study also revealed, they concluded, a high correlation existing between chromogenesis on lactose salt agar and coagulase production.

by the method recommended by Robert A. MacCready, M.D., and Marion B. Holmes, B.S., assistant director and junior bacteriologist, respectively, of the institute of laboratories, Massachusetts Department of Public Health.

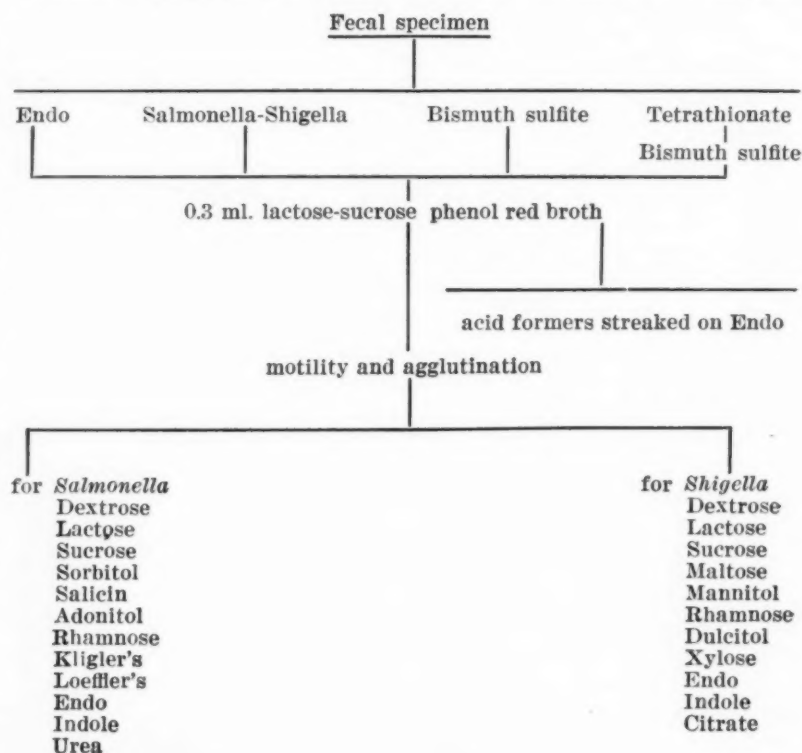
According to their report, the method involves the fishing of colonies from the primary plates into small lactose-sucrose broth tubes (0.3 ml. of broth), incubation for 1-3 hours in a 37° water bath, performance of hanging drop motility and agglutination tests, and inoculation of the confirmatory carbohydrates, all on the same day. This procedure, they said, saves a day over the customary double or triple sugar agar screening techniques. (See chart.)

They also described a method, employing the so-called micro-techniques in all the confirmatory tests, whereby *Salmonella* can frequently be identified only 7 hours after the fishing of the colony and *Shigella*, the following morning.

Salmonella and Shigella Identified in 2 Days

Enteric pathogens can be isolated and identified from stools in 2 days

Outline of procedure for identification of *Salmonella* and *Shigella*



Importance of Animal Diseases To the Health of Man

Problems of animal diseases as they relate to the health and welfare of man were presented at several section meetings. Studies of sporadic bovine encephalomyelitis and an outbreak of psittacosis were reported to the epidemiology section; the effect of mass immunization of dogs against rabies, to the laboratory section. A joint session of the epidemiology and laboratory sections discussed leptospirosis. A paper on foot-and-mouth disease as a threat to the United States and papers on poultry as a potential source of viruses pathogenic to man and on progress in grading poultry and in poultry dressing sanitation were given at a joint session of the engineering, epidemiology, food and nutrition, and laboratory sections.

Foot-and-Mouth Disease Threats Emphasized

Foot-and-mouth disease is the primary animal disease menace in the world, declared M. S. Shaban, D.V.M., of the U. S. Department of Agriculture's Bureau of Animal Industry.

The United States has experienced the disease nine times, the last outbreak occurring in 1929, said Dr. Shahan. The earlier infections were mostly introduced by live animals from infected countries but several times the disease gained entry through infected animal products.

He felt that the United States is fortunate in its comparative geographic isolation and in its largely self-sufficient livestock production, but it still is necessary to import large quantities of animal products.

The difficulties in this country, he said, are complicated by the occurrence of two virus-induced vesicular diseases—stomatitis and exanthema—which are clinically indistinguishable from foot-and-mouth disease. He warned that although it has been 23 years since an occurrence of the disease, there is constant danger of its introduction.

Dr. Shahan described various possible means of eradication through widespread inspection, quarantine, destruction of affected and exposed animals, and disinfection of premises. He emphasized that importation into this country of cattle, sheep, swine, goats, and other susceptible animals—and any meats of these species—is prohibited from any country classed as infected. The Bureau of Animal Industry with the aid of other Federal agencies supervises and inspects such international commerce, he said, and often even garbage from planes and ships is refused entry for livestock feed since it may contain infected meat scraps that could introduce foot-and-mouth disease.

Possible Impact

Although the task of protection is tremendous, he continued, the impact of the disease here could be disastrous since it involves the entire national economy. The productivity of the susceptible species might well be reduced by 25 percent or more, he said, and such a great loss would be multiplied by the stringent quarantines necessary for control.

Dr. Shahan felt that H. S. Frenkel's laboratory success in cultivating an adequate virus vaccine—utilizing minced tongue epithelium in a nutrient synthetic fluid medium—is a significant step toward solving one of the major problems of vaccine production in this field.

In continuance of this country's

vigilance against a possible future outbreak of the disease, he reported that facilities for safe, scientific investigations will be completed by 1954 on Plum Island, in Long Island Sound, N. Y. Congress has already appropriated funds for this project, he said, and plans for its development are now being made.

Bovine Encephalomyelitis In Western Cattle

The agent of sporadic encephalomyelitis has been linked to the psittacosis-lymphogranuloma group of viruses, according to Herbert A. Wenner, M.D., of the University of Kansas Medical Center, Kansas City, Robert W. Menges, D.V.M., epidemiology branch of the Public Health Service Communicable Disease Center, Kansas City, Gerald S. Harshfield, D.V.M., veterinary department of the South Dakota State Agricultural Experiment Station, Brookings, and Te Wen Chang, M.D., fellow of the Haynes Memorial Hospital, Boston.

Dr. Wenner and his associates found encephalomyelitis widespread among young cattle in the midwestern States, with immunity relative or absolute in many adult cattle. An association of human illness with herd outbreaks has not been observed, but these studies are incomplete. Serologic evidence suggests that human beings may have illnesses, yet unrecognized, caused by BEV (bovine encephalomyelitis virus), they stated.

Symptoms Observed

Dr. Wenner pointed out the epidemiological and epizootiological implications of the disease and described the symptoms observed in sick cattle. Morbidity rates for calves averaged 30 percent; mortality rates varied from 20 to 100 percent. Sharply localized epizootics have broken out among herds into which calves purchased from dealers were introduced. The velocity of infection was usually swift and the duration of the illness averaged 4 weeks, the study revealed.

Neeropsies showed a seropurulent exudate involving pleural, pericardial, and peritoneal surfaces. Microscopic examination showed fibrinous serositis and meningoencephalomyelitis.

When tissues from affected calves were inoculated into guinea pigs and into developing chick embryos, illness or death of the experimental host resulted. Minute elementary bodies indistinguishable from those of the psittacosis-lymphogranuloma venereum group were found in both hosts. Antigens prepared from the strains of the virus (BEV) fix complement with specific serums.

Cattle with naturally occurring forms of the disease, as well as those experimentally infected, developed CF antibodies (BEV), the researchers reported.

Rabies Problem Attacked Successfully in St. Louis

Since 1921, rabies has become an increasingly important and complex public health problem in St. Louis, Mo., reported Rabies Control Officer Luther E. Fredrickson, D.V.M., Deputy Health Commissioner Joseph C. Willett, D.V.M., and Health Commissioner J. Earl Smith, M.D., all from the St. Louis Department of Public Welfare, and E. R. Price, D.V.M., public health veterinarian, Missouri Department of Public Health and Welfare.

Six rabies epizootics have occurred in St. Louis since 1921 and each outbreak has been more serious and longer than previous ones. Therefore, according to the health officials, after conferences with local veterinarians and State health officials the St. Louis health commissioner—on advice of an investigating Public Health Service veterinarian—recommended in 1951: (1) mass immunization clinics; (2) an educational program for dog owners; (3) health division control of stray dogs; and (4) an immediate ordinance requiring annual vaccination for all dogs and permanent control of the dog pound by the health commissioner.

A quarantine order requiring every dog in St. Louis to be immunized against rabies and confined to the owner's premises was immediately issued and an emergency fund of \$25,000 was authorized for a mass antirabies program. By June 1, 1951, some 58,000 dogs—70 percent of the city's dog population—were immunized against rabies in public clinics or by private veterinarians.

The results were significant, the officials continued. In August, 2 months after the closing of the public clinics, only one rabid dog was reported, as contrasted with 79 in May. Eighteen dogs were diagnosed as rabid from July–December of 1951 as compared with 309 for the first 6 months of the year, and the incidence has remained low in 1952. However, because of only sporadic control attempts in the metropolitan areas immediately adjacent to St. Louis, Mo., the incidence of rabies there has continued at a relatively high rate.

They concluded that an intensified program of inoculating a high percentage of the canine population in a short period of time is much preferable to sporadic inoculation of small numbers over an extended period.

Techniques for Confirming Leptospirosis Diagnosis

Laboratory confirmation of leptospirosis may be most readily and reliably made by employment of direct blood-culture methods and serologic examination by complement-fixation employing sonic-vibrated leptospiral antigens, reported Maj. William S. Gochenour, Jr., D.V.M., Lt. Col. Robert H. Yager, D.V.M., Joseph E. Smadel, M.D., Psyche W. Wetmore, B.A.; and Capt. John A. Hightower, M.D.

Major Gochenour and Lieutenant Colonel Yager, of the U. S. Army Veterinary Corps, are deputy director and director, respectively, of the veterinary division, Army Medical Service Graduate School, Walter

Reed Army Medical Center. Dr. Smadel is director of the school's communicable disease division; Mrs. Wetmore is with the department of veterinary bacteriology; and Captain Hightower, of the U. S. Army Medical Corps, is with the Tropical Research Medical Laboratory, San Juan, Puerto Rico.

The researchers based their report on studies of 79 bacteriologically proved human cases of acute leptospirosis encountered in Puerto Rico from October 1950 to May 1952. They described in detail the techniques employed in confirmation of the clinical diagnoses and in determination of responses to antibiotic therapy.

Blood cultures should be made during the initial febrile stage of illness, they noted, and serial serum specimens, the first obtained early in the disease, are essential to the demonstration of the diagnostic rise in antibody level.

They announced that both of the procedures recommended are within the capabilities of the routine diagnostic laboratory. Identification of leptospiral strains isolated requires the employment of antibody adsorption techniques and is best accomplished at a leptospiral reference laboratory, they added.

They expressed the opinion that existing knowledge of the antigen-antibody reactions in the leptospirosis does not encourage the hope that new serologic techniques will materially reduce the time required to confirm the diagnosis of leptospirosis. It would appear, they said, that the most promise lies in the direction of earlier detection of leptospirae than is possible with existing methods.

Advances in Leptospirosis Depend on Laboratory Aid

In another paper, Lieutenant Colonel Yager and Major Gochenour suggested four measures for advancing the investigation and control of

the leptospiroses and indicated areas of deficient knowledge in the field.

Most important, they said, adequate support should be made available for basic research into the epidemiology, epizootology, prophylaxis, and control of the leptospiroses. This implies support of fundamental study of the organisms and of the pathogenesis of these diseases, they explained.

A second measure recommended was the establishment of diagnostic laboratory services at the Federal, State, county, and city levels; a third, the establishment of a reference laboratory, comparable to the salmonella typing center at the Public Health Service Communicable Disease Center, to provide definitive identification of leptospiral isolates and technical assistance to the diagnostic laboratories.

Drs. Yager and Gochenour also suggested that leptospiroses in man and domestic animals be placed on the list of reportable diseases. Recognizing the administrative burden inherent in such a step, they nevertheless consider reliable incidence, morbidity, and distribution statistics necessary to the realistic evaluation of the significance of the leptospiroses.

Organism Characteristics

Progress in diagnosis, prophylaxis, and therapy, they said, hinges upon knowledge of the infecting agent itself. Although certain characteristics of the leptospirae have been established, their nutritional requirements, metabolism, and enzyme systems are not known. "Determination of optimal nutritional and environmental requirements for leptospiral cultivation would not only assist in the prosecution of investigative studies," they noted, "but would materially increase the value of culture examination as a diagnostic procedure."

Concerning the epidemiology of the leptospiroses in the United States, the veterinarians pointed out that animal reservoirs of three strains have been established; three lepto-

spiral infections have been recognized only in man; and one has been found only in rats and mice. "It is essential not only that the animal reservoirs of infection be determined, but that the mechanism of transmission of infection to man be demonstrated," they stated.

Therapy and Prophylaxis

Information on therapy is also meager, they said. Reports too often deal with a limited series of patients and are often based upon clinical impressions alone. Excellent studies have been conducted in the laboratory animals on antibiotic therapy, but the encouraging results obtained cannot be translated directly to man or the domestic animals. At present, definitive therapy is limited to the use of aureomycin or streptomycin in dogs.

"Studies on vaccination prophylaxis have been limited to dogs," they continued, "and here a satisfactory vaccine against one strain only . . . has been devised. The problems in development of satisfactory vaccines, though not insurmountable, are formidable. To be of value, such vaccines must protect against all strains known to occur in the species in the United States. Further, not only must clinically apparent disease be prevented, but inapparent renal carrier states as well. This requires a most critical and careful evaluation of vaccines developed in the future."

Suggests New Controls On Psittacine Birds

Further study of psittacosis and some form of renewed control over traffic in psittacine birds were recommended by Theodore S. Drachman, M.D., M.P.H., first deputy health commissioner, Westchester County, N. Y., Department of Health.

After relaxation of foreign quarantine restrictions and removal of interstate barriers, New York revoked controls on the importation,

breeding, and sale of psittacine birds early in 1952. In May 1952, two outbreaks of psittacosis occurred in Peekskill and Ossining, N. Y., both in Westchester County, Dr. Drachman said. The last previously reported cases in the county had occurred 10 years earlier.

Three cases of psittacosis were confirmed in each series, with the possibility of a fourth case in Ossining, and as many as four or more additional cases in Peekskill. The Ossining episode was a typical household outbreak. The one in Peekskill occurred among employees in a chain department store selling parakeets, along with other birds. No connection has been established between the infected birds responsible for the two series of cases, Dr. Drachman said.

Presents Facts

Dr. Drachman reviewed the following facts in the light of the Westchester experience:

There appears to be a generalized endemicity of psittacosis on certain bird farms in Florida and some other States. Despite control measures imposed in Florida aviaries where the disease is known to exist, it is impossible to say with absolute assurance that birds shipped from Florida or anywhere else in the country are free from psittacosis.

When blood sent to laboratories for other types of examination is tested for psittacosis antibodies, a far from routine laboratory procedure, unsuspected cases are discovered. The possibility of many missed cases is suggested. In half of these cases, inquiry failed to reveal birds or mammals in the patients' environment.

The case fatality rate, as high as 40 percent in the past, has been reduced to 2 percent with antibiotics. Yet little appears to be known of the possibility of developing fastness to antibiotics. In the few Westchester cases, although there were no fatalities, relapses and prolonged convalescences were not prevented by antibiotic therapy.

To Be Answered

Dr. Drachman recommended further study of these questions:

Why is psittacosis highly communicable and dangerous to laboratory workers, moderately communicable on contact with infected birds whether apparently ill or not, and difficult to contract from a human case?

What is the actual psittacosis experience of the general population? Is it a common disease, or a rare one as has been believed?

What are the factors that determine human susceptibility?

Are there differences of epidemiological importance in the psittacine and nonpsittacine strains of the virus as implied by the separate terms of psittacosis and ornithosis? Is there a significant difference in the indoor exposure to a pet and to infected poultry outside?

What is the likelihood of a human carrier of virus, casual or otherwise, infecting a previously healthy household pet which may then become a health menace?

Poultry Grading Program Continues to Grow

Interest of public health groups in the U. S. Department of Agriculture program of grading poultry on a voluntary basis is stimulating health departments to give special attention to the drafting of sanitation standards for poultry plants, said Alfred H. Fletcher, M.S., director, division of environmental sanitation, New Jersey State Department of Health.

Mr. Fletcher also reported that as a result of the mutual interest of national health groups, the poultry industry, and the Department of Agriculture in better grading standards, the department's grade label will not be stamped on eviscerated poultry after June 30, 1953, unless the poultry has been inspected for wholesomeness and processed under sanitary conditions.

"It is hoped that this action will tend to further encourage the processing of poultry in the ready-to-cook form," he said, remarking that it would be highly desirable from the public health standpoint.

Other Achievements

Reporting on other achievements of the voluntary program, he said:

Poultry inspection in 1952 has increased about 40 percent over 1951. Approximately 17 percent of the total poultry sold on a dressed weight basis is inspected. About 100 million more pounds of poultry were graded in fiscal year 1952 than in 1951. Grading service is now maintained in 312 processing plants. More than half of the poultry sold from farms in fiscal 1952 moved in ready-to-cook form at the processor level. And almost 800 million pounds of poultry were inspected for wholesomeness.

The voluntary program depends on the cooperation of the processor and the willingness of the consumer to pay the extra cost of the grading service, Mr. Fletcher stated. It is under the Department of Agriculture's Production and Marketing Administration and provides services at each plant, for each bird.

"A sound Federal poultry grading inspection program is considered basic to the development of sound local public health programs," Mr. Fletcher declared. The Federal program sets the pace for content and standards, and the plants under its supervision form the nucleus around which States develop their local programs, he indicated.

Viruses Pathogenic to Man Carried by Poultry

Poultry must be regarded as a potential reservoir of viruses pathogenic to man, warned H. J. Stafseth, D.V.M., Ph.D., head of the department of bacteriology and public health, Michigan State College.

Dr. Stafseth based this premise on a review of the literature of the bacterial and viral diseases which afflict poultry. However, he stated that although some two dozen poultry diseases are communicable to man, at present most of the cases of human illness contracted from poultry have been confined to individuals or small groups, that very rarely have considerable numbers of people been affected.

He listed salmonellosis, psittacosis, erysipelas, and Newcastle disease, as those with most public health significance.

Four Government Agencies Concerned With Poultry

The Food and Drug Administration, the Public Health Service, and the U. S. Departments of Agriculture and Defense are all concerned with poultry dressing sanitation, and each performs activities clearly defined through public law, but all work together to obtain a unified program, stated Harry E. Goresline, Ph.D., chief, stability division, Food and Container Institute, Chicago Quartermaster Depot, U. S. Army, Chicago.

The Food and Drug Administration is concerned with poultry products in interstate commerce or products being processed for that purpose, he noted, the aim being to prevent shipment of birds diseased, improperly processed, filthy, decomposed, or in any way injurious to health. Market surveys regularly determine the quality and condition of the poultry products being sold, and a regular program of sanitary inspection of poultry plants is carried out. Legal action may be taken against processors when objectionable conditions are found.

The Public Health Service provides advisory, information, and consultation services for other Federal agencies, the States and their political subdivisions, and food industries.

Dr. Goresline said. He remarked that the Service has initiated field studies on the sanitation problems of the poultry industry and intends to develop sanitation standards, covering inspection for wholesomeness, which can be incorporated into a model standard ordinance. The ordinance, of course, will be for voluntary adoption by States, cities, and other jurisdictions concerned, he added.

Agriculture and Defense

The U. S. Department of Agriculture offers poultry inspection and grading services to individuals, processing plants, or other interested parties upon request. An applicant for such services must comply with certain sanitary regulations and pay the costs of the services. The purpose of poultry inspection, he explained, is to determine, during the eviscerating operation, the condition, healthfulness, and fitness of poultry for human food and the wholesomeness of edible parts or processed products produced from inspected poultry. Poultry grading involves the sorting of individual carcasses as to quality and size and the determination of class and condition.

The poultry sanitation program in the U. S. Department of Defense, he continued, is centered around the procurement of poultry meat for the armed forces. The awarding of contracts for poultry meat is limited to approved plants or to those operating under the Department of Agriculture poultry inspection service. If only dressed poultry is produced, the operation must be carried out under the supervision of armed forces veterinarians, he noted. However, if various types of ready-to-cook or canned poultry products are being produced, the plant must be operated under the supervision of the poultry inspection service of the Department of Agriculture. The actual inspection of the product is a responsibility of the armed forces, he added.

Problems, Methods, Programs In Community Fly Control

Community fly control operations in various parts of the country were described in papers presented before the Conference of Municipal Public Health Engineers. In Kansas City, Mo., special fly problems were created by the flood of Missouri-Kansas Rivers in 1951. In Phoenix, Ariz., a fly control program is devoting its major efforts to correcting insanitary conditions, particularly the indiscriminate dumping of wastes from the vegetable-packing industry in the State. The Texas program is described as "just plain community sanitation, glamorized with the magic of wonder chemicals and systematized by fly density estimating techniques."

1951 Kansas River Flood Creates Fly Problems

Fly counts during the height of activities in the wake of the Kansas River flood, July 1951, ranged from 2 to 500 per square yard in the central industrial district of Kansas City, Mo., and averaged 150 per square yard in other areas studied, Carl C. Potter, B.S., commissioner, public health engineering, Kansas City Health Department, stated.

Immediate health problems during and following the flood were lack of drinking water, disruption of plumbing and garbage collection, proper housing, food service in establishments allowed to operate, and the expected prevalence of insects when the waters subsided. Garbage collection was disrupted when vehicles were caught in the flood. This factor and an estimated 15,000 dead stockyard animals

caused the health department immediate concern in regard to fly control, Mr. Potter said.

The animal carcasses were dumped into the river, and were immediately carried on into the Missouri River. This practice continued for 6 days until trucks and equipment were available to transport the dead animals to landfill dumps.

As the flood subsided it was clear that the dead animals were not the greatest source of fly-breeding problems. The clean-up had been rapid enough to keep this under control, the speaker continued. Damaged seed, grain, and foodstuffs which had taken more time to remove were found to be the heaviest breeding places for the flies.

Control measures consisted of the use of 8,800 gallons of 0.5 percent BHC emulsion in larviciding, 450 gallons of 5 percent DDT emulsion in residual spraying, and 330 gallons of 5 percent DDT and 2 percent chlordane emulsion in space spraying. The spraying and larviciding were continued until the entire district was cleaned up and business resumed operation.

Control Effort Makes City Less Attractive for Flies

Although temporary fly control measures, such as space spraying, are occasionally utilized, the major efforts of the Phoenix, Ariz., program are devoted to eliminating insanitary conditions, said Jerrold M. Michael, M.S.E., superintendent of sanitation, Phoenix Public Health Department.

The major sanitation problems given attention, according to Mr. Michael's report, were chicken and animal pens; refuse storage, collection, and disposal; substandard

sewage disposal systems; large-scale commercial animal feeding operations; food processing plants; waste vegetable disposal fields; and waste water disposal from evaporative cooling systems. An example of permanent corrective measures instituted, he said, is a newly developed process of waste vegetable reclamation.

"In past years, culls and wastes from the vegetable-growing industry of Arizona have been dumped wherever the packer could find available space," he explained. "As the area around the packing shed became more urbanized, the fly problem . . . grew steadily worse." A solution having economic value as well as eliminating fly breeding spots was the adoption of a method of recovering the vegetable wastes for livestock feed.

Other accomplishments of the 4-year-old program included: installation of 13,000 new garbage containers; wrapping of garbage by 75 percent of the housewives; purchase of 9 new packer-type garbage collection vehicles, increasing the number to 14; establishment of a sanitary landfill, practically eliminating the feeding of garbage to hogs; 75-percent reduction in number of animal pens and 51-percent in number of fowl pens; elimination of 324 privies; and renovation of waste disposal systems in four abattoirs.

Program Development

He named as essential steps in developing a fly control program: establishing interest among city officials, the public, and the staff who will operate the program; defining specific problems needing attention; training a staff; and finally, applying control and inspection measures.

He pointed out that it is particularly important, in defining the problem, to include in the program the area surrounding a city's corporate boundaries, as "the fly . . . is a notorious violator of 'City Limits' signs." Once the extensiveness of each problem is determined, decisions may be made as to the problems to receive initial efforts,

although, of course, many of the problems will be interrelated, he added.

Mr. Michael emphasized that the fly control staff should work closely with other members of the sanitation staff, particularly milk and meat inspectors and the sanitarians who inspect restaurants, groceries, hotels, and bottling plants. These sanitarians can incorporate fly control measures into their routine inspections, he explained. A close liaison should also be maintained with the city's refuse collection authorities.

More Communities Adopt Fly Control Programs

Education—sanitation—spraying! These are the three steps vital to every successful community program for fly control, and more such local programs must be developed if the annual 9,000 deaths from fly-borne dysentery and diarrhea in the United States are to be reduced, said Joseph H. Coffey, B.C.E., and Paul W. Purdom, M.S.E., of the Public Health Service's Communicable Disease Center, Atlanta, Ga.

To encourage this development, they said, the Public Health Service inaugurated, in 1950, a CDC program to demonstrate to State and local health agencies how fly control could be achieved by communities.

They reported that seven demonstration projects were established in four States with high incidence of fly-borne dysentery—two each in Arizona, New Mexico, and Texas, and one in Kentucky. CDC provided technical personnel and guidance for the projects, but all costs of sanitation measures, spray materials, and their application were assumed by the communities.

Emphasize Prevention

The three-point program emphasizes that "the [best] way of attacking [flies] is to prevent them from breeding," and is applicable to most communities, they continued. In the initial educational phase, they explained, the entire community—indi-

viduals and groups of all types: housewives, pet owners, restaurateurs, farmers, food processors, and others—must be informed of the nature, habits, and preferred breeding places of flies, their danger to the community, and what can be done to eliminate them.

Second, adequate sanitation facilities must be provided in the community to eliminate fly breeding sources, they said. The demonstration program indicated that sanitation measures should be concentrated on refuse and on human, animal, and industrial wastes. They emphasized that not only should privies be eliminated, and frequent and thorough collection and disposal of refuse be made, but that all homes should be connected to existing sewers with new sewers extended to unserved areas.

Although these permanent accomplishments are generally more economical and effective to the community than are temporary measures, they are slow to achieve, they reported. Immediate sanitation needs can be satisfied by judicious chemical spraying of key breeding locations, they said, provided adequate consideration is given to the species of flies present and the chemicals and application methods required to eliminate them.

The fly control program proved effective in the demonstration projects, they reported, and 34 additional cities have adopted its principles, partly or wholly, under completely local sponsorship. Supervised by State fly control specialists, some cities have hired and trained their own control personnel, and many others are requesting technical assistance from State health departments.

Texas' Fly Control Plan Sparks City Development

Texas' fly control program is stimulating modernization of city facilities and plans for future community development, reported Clay-

ton H. Billings, M.S., senior engineer, Texas State Department of Health.

"Just plain community sanitation, glamourized with the magic of wonder chemicals and systematized by fly density estimating techniques, is our fly control program of today," he said.

Texas found that carrying a fly control program to completion meant overlapping in other health fields. Privy elimination meant sewer extensions. Sewer extensions led to enlargement of treatment plants and water system extensions, sometimes requiring increased water supply capacity. People even repainted and remodeled their homes.

One real estate developer began a subdivision of low-cost homes after learning that people living in a substandard environment would cooperate in a garbage storage and privy elimination program, Mr. Billings said.

In Kingsville, all oil drums customarily used for garbage storage were confiscated, and the city purchased 85 dozen standard containers for sale, even on credit terms, to the public at acquisition cost, he reported.

Brenham maintains all privies at cost to the householder. As sewers are completed, Brenham eliminates privies by merely reclaiming its property, he said.

Privies which could not be removed through lack of available sewers were factors contributing to high grill counts. This led to the use by the State of 10 percent DDT dust in privy vaults and, later, 3 percent BHC dust.

No Organization Conflict

Vector disease control is under the bureau of sanitary engineering, which also handles other environmental sanitation, Mr. Billings said. He explained that policy and jurisdictional decisions presented no conflict since all projects were cleared at the State level and through the bureau's field offices.

Two demonstration projects were conducted in central Texas and near the Gulf Coast in 1950. Eight cities in 1951, and 28 in 1952, responded by undertaking locally financed projects. In the program expansion, it was planned to select sites significant from a diarrhea-dysentery standpoint and geographically located to influence surrounding areas, Mr. Billings remarked.

Most projects, however, were requested by city officials, some after an epidemic or disaster. One followed the 1951 polio and dysentery epidemic in Corpus Christi. An original control town, Mathis, "grew tired of being held a bad example and insisted on instituting standard fly control procedures," he said. Olney set up a project after a severe disaster. Strategically located projects were undertaken at Henderson, Braunfels, Midland, and Brownwood.

Fly control schools gave municipal officials a 3-day training in the use of insecticide application equipment,

fly grill counting methods, and other techniques. Thirty-one schools were held in 23 locations, he reported.

Corpus Christi's Control

In Corpus Christi, block-by-block premise inspection was conducted in substandard areas by a health unit sanitarian, a voluntary worker, and a police officer. In 1952 there were only 320 privies left from the original 1950 count of 2,446 privies within city limits. Enforcement of the plumbing ordinance since 1950 has converted to individual units 490 of about 700 community toilets serving two or more houses, he reported.

Mr. Billings compared the 30 infant diarrhea deaths in 1951, and 7 so far for 1952, with the 10-year average of 90.3 per year for Nueces County in which Corpus Christi is located. This improvement, he said, was attributed by the city-county health director to the combined efforts of the fly-control program and the well-child conferences.

Varied Methods and Practices In Providing Medical Services

A variety of methods and practices in the provision of medical services were described before sections of the APHA and associated groups in Cleveland. Rural group practice in a low-income community over a 6½-year period was reported, along with 8 years' experience with a group indemnity program in a metropolitan area. New York's Health Insurance Plan was described, as was the 6-year-old industrial program for hotel workers. From San Francisco came the story of multiphasic screening of longshoremen, and

hospital consultants heard a plea for a functional approach to hospital architecture.

County Group Provides Care in Reach of 90%

An example of providing a low-income community with the best available in medical care at a cost that at least 90 percent of the people can afford was cited by Caldwell Blakeman Esselstyn, M.D., medical director of the Rip Van Winkle Clinic, Hudson, N. Y., in his description of 6½ years' experience of group practice in that rural area.

Established under the aegis of a nonprofit, tax-exempt corporation, the clinic is staffed by 17 doctors. Services in 14 areas of medicine (including psychiatry) and dentistry are provided.

To make clinic membership attractive to physicians, immediate financial security is provided through salaries, cases are distributed in accordance with the various specialties, regular luncheon meetings are held for the staff, and fortnightly meetings are addressed by medical leaders in all fields. Provisions have been made for teaching responsibilities at the nearest medical center and the clinic has made available a current reference library and funds to enable the doctors to attend important conferences.

Branch Centers

To serve the outlying areas of Hudson County, two branch centers were established in 1950 in towns where medical services were lacking or were inadequate. They are served by a dentist and are in charge of a resident internist, while services of other members of the clinic are provided on a rotation system. That these branches are being utilized is shown by their services to 1,873 and 1,577 patients, respectively, Dr. Esselstyn pointed out.

To make services available at a cost that 90 percent of the people could afford, a fee schedule was established about the equivalent of the fees paid by a full-rate patient of a free out-patient department in New York City. No means test has ever been applied and 24 months of credit are extended to those desiring time to meet their obligations. For medically indigent families, \$88,000 worth of free care has been provided by the dispensary. No person has ever been refused medical care for financial reasons, said Dr. Esselstyn.

Preventive medicine is one of the main purposes of the clinic. The cancer detection center, organized

at the request of the American Cancer Society in 1947 and the first in upstate New York, is today recognized by the American College of Surgeons as a tumor diagnostic clinic. An outgrowth of this work is an annual review program, offering thorough medical examination designed for the symptom-free well adult. While not widely accepted by the people in the county, three corporations are now arranging this program for their executives.

Initial Problems

The establishment of this organization has not been without difficulties, said Dr. Esselstyn. Among them has been community skepticism. Also, fellow practitioners resisted despite the fact that each man in the clinic is a replacement and not an additional physician in the area, and every effort has been made to maintain the confidence of the patient in the referring physician, and to keep the referring physician promptly advised on findings.

The clinic experimented with a percentage system of remuneration in order to include two local practitioners on its staff. It found that this basis of remuneration acted as a deterrent to ease of referral since it automatically set up competition between the members of the staff and also between its departments. As a result it produced the clinic's present policy, namely, that men of equal training who are devoting an equal amount of time and effort and have served an equal number of years should be paid in equal amounts.

Dr. Esselstyn also pointed out that the community was rapidly transferring from the dream of the general practitioner of the past to the realism of the well-trained internist of the present, who functions as the family doctor of today within the group structure. When this has been fully understood one of the misconceptions associated with group practice will have been eliminated, he said.

4,000 Longshoremen Get Multiphasic Screening

Multiphasic screening with organized medical follow-up of some 4,000 longshoremen in the San Francisco area was successfully accomplished as a result of the active cooperation of the International Longshoremen's and Warehousemen's Union, the labor-management welfare fund, the Permanente Health Plan, and a wide array of public and voluntary health agencies in the community, E. Richard Weinerman, M.D., M.P.H., medical director of the Permanente Health Plan at the time of the survey and now medical consultant of the San Francisco Labor Council, and his associates, reported.

A battery of laboratory and other tests screened presumptive cases for clinical follow-up in the group medical centers of the Permanente Health Plan, a prepaid health plan in which the workers were enrolled. Screening procedures consisted of medical history, chest X-ray, electrocardiogram, and tests for height and weight, vision, hearing, syphilis, hemoglobin, blood sugar, urine sugar, urine albumin, and blood pressure.

Associated with Dr. Weinerman in the study were Lester Breslow, M.D., M.P.H., chief, bureau of chronic diseases, Benno K. Milmore, M.D., M.P.H., acting chief, bureau of chronic diseases, and Nedra B. Belloc, M.A., associate statistician, morbidity research project, all of the California State Department of Public Health, and Anne Waybur, A.B., health educator for the union.

Diseases, Defects Found

Diagnostic evaluation of men with positive test findings revealed significant amounts of disease and defect not previously known or not medically controlled, the study showed. The most striking health problem of these men, the majority of whom were in the older age brackets, was obesity, which showed a significant correlation with hyper-

tensive disease and diabetes. Dr. Weinerman pointed out that 35 percent of the men tested had one or more positive diagnoses. More than half of these, representing one-fifth of the total tested, had at least one newly discovered condition.

The estimated total cost of \$9 per person tested for the screening and initial follow-up was considered by Dr. Weinerman to be modest in terms of the health values attained. Multiphasic screening combined with organized follow-up, which eliminates the economic barrier to medical service, was presented as a useful technique for positive health education, early detection of disease, timely application of medical care, and delineation of controllable public health problems.

Broad Indemnity Program At ACWA Health Center

Members of the Amalgamated Clothing Workers of America have been covered by a comprehensive hospitalization and surgical indemnity program since 1944, but to furnish them even broader medical services the union's New York Joint Board opened the Sidney Hillman Health Center in April 1951 in lower Manhattan's garment industry area, reported Morris A. Brand, M.D., medical director of the center.

In a six-story building where comprehensive clinical services are provided in a spacious, colorful, well-lighted, and unhurried atmosphere, he continued, there are 34 examining and treatment rooms—including special suites for minor surgery, electrocardiography, radiology, cardiology, otolaryngology, physical medicine, and ophthalmology—60 dressing cubicles, and a clinical laboratory, a pharmacy, and a medical record room.

Although the center does not provide psychiatric treatment, dental care, or treatment for illnesses covered by workmen's compensation insurance, each member, upon payment of an annual 10-dollar fee, is

entitled to otherwise unlimited physicians' services. Additional nominal fees for treatments in physical medicine and for radiological and laboratory services were eliminated January 2, 1952. Approximately 33,000 union members and their wives were enrolled in the center at the end of 1952, Dr. Brand said, and 76.9 percent of those seeking services were 40 years of age or older.

During the center's first 18 months, he continued, its medical staff of 27 general physicians and 54 specialists provided 27,058 hours of service, 14,566 and 12,492 hours, respectively. All of them accept the ACVA Insurance Fund's surgical fees as their total fees for operations performed for the center's members.

Functional Hospitals Foster Improved Care

Hospitals must be architecturally functional if they are to provide adequate medical service to all who require it, maintained E. M. Bluestone, M.D., consultant at New York City's Montefiore Hospital. He told the joint meeting of the medical care section and the American Association of Hospital Consultants that flexibility of arrangement to permit continuing expansion of service is the absolute requirement of such construction.

Organized medical care is becoming increasingly better, Dr. Bluestone declared, and hospitals can lead in the progress through an expansion of both in-patient and out-patient facilities and services. But it must be an integrated expansion, he stressed; there can be no such line of demarcation between the two programs as a fixed hospital wall. He emphasized that medical care must not only be comprehensive and complete, but also must be continuous and sufficiently mobile as to be available to everyone, regardless of his urban, suburban, or rural location.

"Not Only the Sick"

To provide such extensive care, he continued, the hospital must treat not only the sick, but also the near and recently sick. Therefore, the medical, nursing, and social organizations of the hospital must be adjusted to the distinctive requirements of each group. A shift of emphasis by the hospital from the in-patient to the out-patient department, with attendant expansion of home nursing and social services, will reduce the demand on beds within the hospital, he said, but it will force the expansion of diagnostic, therapeutic, laboratory, and operating room facilities for they will have to serve beds outside as well as inside the hospital.

These are trends which the architect, as well as hospital trustees, should consider in planning suitably functional hospitals, Dr. Bluestone averred. He felt, however, that not only are few architects professionally equipped to survey accurately the present and future medical requirements of a community, but that many hospital executives also lack the ability to make such a study. Planning for medical care requires a working combination of both professional skills, he said.

Patient Choice Fosters HIP Group Competition

The vast majority of the 400,000 enrollees of the Health Insurance Plan of Greater New York "are convinced they are receiving the best medical care they have even known," Edwin F. Daily, M.D., deputy medical director of HIP reported to the medical care section.

Standards Are High

Medical care in HIP, said Dr. Daily, is provided only by physicians meeting the professional standards of the HIP medical control board. They work in groups, each group comprising at least 5 family physicians and a specialist from each of the 12 basic specialties of medicine

and surgery. Regular clinical staff meetings are required in each group, he continued, and emergency night and week-end calls are rotated among the members. Healthy competition between groups is maintained, he stated, since subscribers are free to change groups or family physicians within a group.

Centers Required

Each medical group must have a center with sufficient facilities for all ambulatory services by both family physicians and specialists, Dr. Daily said, as well as laboratory, X-ray, and special services such as electrocardiography, basal metabolism, and physical therapy.

All necessary medical care is provided for an annual fee per person paid to the selected medical group, Dr. Daily stated. After overhead and administrative costs have been paid, the remaining income is distributed among the physicians according to the formula of their particular group. "The capitation basis of payment . . . is a most important principle," he said, "relating fundamentally to the quality of medical care provided."

New subscribers are informed of the available services and the methods of using them, according to Dr. Daily, and are encouraged to discuss with their medical group directors any dissatisfaction with the plan and to offer suggestions for improvement. The subscriber service division at HIP headquarters receives all inquiries, complaints, and expressions of satisfaction with the plan. At meetings under the guidance of the HIP education staff the medical groups and their subscribers discuss subjects of mutual interest.

Medical Care Quality Reviewed

A study of the quality of medical care in all groups was made in 1949, Dr. Daily reported, and individual meetings were held with medical group directors and their staffs to review the findings. During the past year case histories of adults examined in several medical groups have been reviewed, he continued,

and statistical studies are continually under way "to detect any weaknesses . . . and to bring about improvements as rapidly as possible."

NYC Hotel Employees Have Modern Medical Center

Hotel employees in New York City were the first in the hotel industry to benefit by industry-wide group insurance, according to Frank P. Guidotti, M.D., medical director of the New York Hotel Trades Council and the Hotel Association Health Center, Inc., New York. Over \$5 million in benefits, including payments from life insurance, accidental death and dismemberment insurance, weekly accident and sickness benefits, and hospital benefits, were paid to beneficiaries and their families during the first 6 years of operation.

This program, known as the New York Hotel Trades Council and Hotel Association Insurance Fund, was created by the joint action of the Hotel Association of New York City, representing management, and the New York Hotel Trades Council (affiliated with the American Federation of Labor), representing labor, explained Dr. Guidotti. Ten local unions form the New York Hotel Trades Council.

Modern Facilities

On October 25, 1950, the New York Hotel Trades Council and Hotel Association Health Center opened a modernized 5-story building in mid-Manhattan to provide a comprehensive preventive medical program, diagnostic and specialist services, as well as in-hospital medical and surgical care to all hotel workers as of the first day of employment. The center's technical staff has 175 physicians (30 general practitioners and 145 specialists), 13 nurses, 4 laboratory technicians, 3 X-ray technicians, 2 physiotherapists, 2 pharmacists, 2 registered medical record librarians, and a registered medical social service worker.

The center encourages the relationship between patient and physician and cooperates with referring family physicians, Dr. Guidotti maintained. Patients are seen usually on the appointment basis. In addition to general medical services, optical examinations are offered, and counsel on social aspects of a patient's problem is given by the medical social service worker.

The health center maintains visiting nurses, blood bank services, and free ambulance service, said Dr. Guidotti. It distributes monthly information pamphlets on preventive medicine and health information; it recently established a pension plan for retirement benefits for hotel employees.

Care for 35,000

The health center provides care for 35,000 hotel workers, ranging in age from 18 to 85, who are employed in 177 New York City hotels and 51 concessions, representing 209 different occupations. Maids, waiters and waitresses, elevator operators, housemen, cooks, dishwashers, bellmen, busboys, and telephone operators are the most numerous employees.

Physician services per patient averaged 6.5 for the first year. Records showed the most frequent diagnoses to be:

| | Number |
|---|--------|
| Refractive errors----- | 1,350 |
| Hypertension and hypertensive heart disease----- | 916 |
| Acute upper respiratory infections----- | 852 |
| Allergic disease, including hay fever and asthma----- | 576 |
| Varicose veins----- | 572 |
| Arthritis----- | 480 |

Funds are provided for this entire welfare program by an established percentage of the payroll of each contributing member-hotel. Cost of operation for the first year was \$600,000, approximately \$17 per capita, according to Dr. Guidotti. Medical services are provided without charge to eligible patients. Prescriptions are filled at cost by the center's pharmacy.

New and Developing Elements In Public Health Programs

That the dimensions and characteristics of public health are fluid and ever-changing is well illustrated in the foregoing summaries of major papers. By way of further illustration are the following summaries dealing with a miscellany of topics ranging from rheumatic fever to home safety and a critical examination of the health officer's job.

Test Indicates Absence Of Rheumatic Fever

Reporting that a low antistreptolysin-O (AST-O) serum level is highly reliable as a single diagnostic index of the absence of active rheumatic fever, Nell F. Hollinger, Ph.D., assistant professor of public health, University of California, said that if an AST-O serum level of 50 or less Todd units is obtained repeatedly for a child with a clinical diagnosis of active rheumatic fever, re-evaluation of other medical findings is indicated.

Dr. Hollinger reported the results of a 5-year study of the serums of 6,332 rheumatic and nonrheumatic children. Well children, or those with illnesses other than rheumatic fever, were grouped as nonrheumatic children.

Just as a negative tuberculin reaction confirms the absence of active tuberculosis, Dr. Hollinger said, a negative reaction to the antistreptolysin test might prove to be of considerable clinical worth in indicating absence of active rheumatic fever.

Determination of AST-O is a simple serologic procedure, reliable within accepted serologic limits, according to Dr. Hollinger. AST-O is

the antibody of streptolysin-O, a streptococcal product, and is present at some time in the serum of at least 90 percent of those who have had streptococcal infections. The antigen, streptolysin-O, is used to test for the presence of the antibody AST-O. The Todd unit of antiserum is used as an arbitrary standard to test the neutralizing of new lots of antigen, she explained.

Clinical Values

Other significant conclusions reported by Dr. Hollinger include:

AST-O values presented in this study and others published over a 20-year period show that only 0.82 percent of 1,339 individuals with active rheumatic fever would have been misclassified as nonrheumatics if 50 or less Todd units were used as the diagnostic exclusion index.

A high AST-O serum level, over 250 Todd units, was found to be a misleading guide when used as a single diagnostic index of the presence of active rheumatic fever. On the basis of such an index, 19.4 percent of 5,135 nonrheumatics would be misclassified as active rheumatics; and 42.5 percent of 197 children with active rheumatic fever would be misclassified as nonrheumatics. A higher AST-O serum level of over 800 Todd units would be even more misleading since 88 percent would be classed as nonrheumatics; and 5 percent with illness other than active rheumatic fever would be misclassified as active rheumatics.

No universal pattern of AST-O serum levels was obtained for AST-O values tabulated as normal (well children), active RF (for children with active rheumatic fever), or clinic-nonRF (for children with illness other than active rheumatic fever). With the exception of normals for Texas, 30 percent of normal and clinic-nonRF AST-O values

for California, Colorado, North Carolina, Texas, and Vermont were found to be 50 or less Todd units.

Believe Hospital Contacts Spread Resistant Strains

Urging a halt to the practice of indiscriminate administration of antibiotics for a host of minor illnesses, three University of Illinois epidemiologists reported their observations on the epidemiological spread of antibiotic-resistant staphylococci among hospital patients, their contacts, and hospital personnel.

Presenting the report were Harry F. Dowling, M.D., professor and head of the department of medicine; Mark H. Lepper, M.D., associate professor, department of preventive medicine; and George G. Jackson, M.D., assistant professor of medicine and preventive medicine of the University's College of Medicine.

"The number of antibiotic-resistant strains in a given segment of the population presumably increases with the number of individuals who have received antibiotic therapy," they explained. "It would be profitable to explore techniques of managing patients under treatment with antibiotics so as to prevent as much as possible the spread of resistant strains via hospital personnel to other patients."

The investigators noted that the appearance of resistant strains has followed treatment with penicillin, but "often, perhaps more often, has been due to the spread of resistant strains to hospitalized patients from other patients and from attendants."

Cultures Studied

Drs. Dowling, Lepper, and Jackson investigated the sensitivity to aureomycin and penicillin of the staphylococci strains present in the noses and throats of patients discharged from the Municipal Contagious Disease Hospital, Chicago. Cultures were taken from the patients' household contacts and from

hospital personnel. Before discharge and for 8 to 21 weeks after discharge, 191 cultures were taken from the noses and throats of 54 patients; and 1,213 cultures were taken from their 209 household contacts, of which 33 percent were positive for staphylococci.

Staphylococci resistant to penicillin and aureomycin occur in larger numbers among patients for several weeks after their discharge from the hospital than in the population at large, the study showed. Staphylococci were found in 74 percent of the cultures taken from the patient on discharge, but the percentage decreased progressively until the fourth week after discharge, when it remained at approximately 36 percent, they said. Also, staphylococci were present in 33 percent of the household contacts, but the percentage did not vary significantly from week to week, they noted.

Penicillin and aureomycin sensitivity of the staphylococci cultures were studied. Comparative percentages of inhibition for the respective antibiotics were 85 and 64 for hospital personnel, 88 and 78 for patients at time of discharge, and 30 and 7 for household contacts. One or more units of penicillin and 10 or more micrograms of aureomycin were required.

Resistant strains, the epidemiologists concluded, may be acquired while the patient is being treated with the antibiotic in question, or with a closely related antibiotic; while he is in the hospital even though antibiotics are not being administered; or in the community from symptomless carriers.

Presumably, hospital personnel act as carriers, and resistant strains are transferred from other patients receiving antibiotics, they said. They indicated that the third transfer mechanism has not been investigated in detail. They also found an indication that a strain was more likely to be transferred when its site of origin was in the throat rather than in the nose.

Tetanus Toxoid Test Evaluates Potency

Valid biological standardization of alum-precipitated tetanus toxoids is possible, stated Johannes Ipsen, Jr., M.D., M.P.H., superintendent of the institute of laboratories, Massachusetts Department of Public Health, and associate professor of public health, Harvard University School of Medicine.

The official minimum requirement test excludes from public use toxoids which have poor potency, but it does not provide sufficient information on the relative merits of approved toxoids for manufacturers to judge and to improve their products, the speaker said. Therefore, to evaluate the relative potencies of good tetanus toxoids, four toxoids which fulfilled official requirements for human use, each obtained from a different manufacturer, were tested on mice, guinea pigs, and human beings.

Comparison of the potency of two or more preparations tested in the same population sample is the basis of a valid assay, Dr. Ipsen stated. Relative potency of the preparations to be tested should be the same, regardless of dose level or of animal species used, he continued, but the ultimate test of validity consists in demonstrating that relative potency will be the same in human beings as in experimental animals. According to Dr. Ipsen, the conditions of the study reported met all of these criteria, and results of the three assay methods tested were sufficiently comparable to indicate that cost is the primary consideration in making a choice. Mouse assays are by far the least expensive, he concluded.

Murine Typhus in South Appears Over-Reported

Studies of reported cases of murine typhus in eight southern States indicate that during recent years this disease has been over-reported, according to Griffith E. Quinby, M.D.,

M.P.H., and Joseph H. Schubert, Ph.D.

Dr. Quinby is chief of the malaria and typhus appraisal unit and Dr. Schubert is chief of the serology unit of the laboratory branch of the Public Health Service's Communicable Disease Center at Atlanta, Ga.

Prior to 1946, the researchers stated, murine typhus was apparently under-reported, but results of the appraisal program carried out by CDC from 1948 through 1951 show over-reporting, particularly in areas where the disease now occurs only sporadically. In some of the States participating in the study, investigators found that conditions such as measles and drug rashes were being diagnosed as murine typhus, and that there was variation among laboratories in performance technique of the Weil-Felix test and in interpretation of its results, they reported.

Murine typhus was epidemiologically and serologically confirmed in 58 percent of the 250 reported cases tested in the program and in 33 percent of the 40 unreported cases, they stated, whereas 25 percent of the reported and 40 percent of the unreported cases tested were appraised as not being typhus.

More intensive and extensive appraisal of communicable disease will be necessary, they concluded, to determine the degree to which under-reporting of typhus cases in some areas will offset over-reporting in others.

Use of Nutritional Surveys In Program Planning

In an informal panel discussion before the food and nutrition and maternal and child health sections, it was emphasized that surveys should be carefully planned and conducted to be of value in developing nutrition programs.

A. Hughes Bryan, M.D., professor of nutrition at the University of North Carolina School of Public Health, acted as panel moderator.

He defined nutritional surveys as including studies of nutritional status and food habits and preferences.

The survey has value for both long-term and short-term planning, remarked Bertlyn Bosley, Ph.D., chief of the nutrition section, North Carolina State Board of Health. Part of the information obtained from studies of dietary practices, he said, can be "applied to an immediate action program, but the long-range program should be developed concurrently."

Marion Hotopp, M.D., director of the division of maternal and child health of the New Mexico State Department of Public Health, suggested a series of relatively short local surveys might yield information more valuable to individual communities than the cumbersome state-wide survey.

Survey the Many

Interest in planning a public health nutrition program is in the food practices of the multitude rather than in the dietary habits of a few individuals, reported Alice Glenn Keaton, M.P.H., supervisor of nutrition services for the Mississippi State Board of Health.

A knowledge of the dietary trends of a large number of people and varied groups of different ages may be used as a basis for planning a sound nutrition program geared to the needs of the population under consideration, she said.

Miss Keaton reported an instance in which survey information has proved useful. In Mississippi, a dietary survey, a survey of nutritional status of pregnant and lactating women, and a hemoglobin study on infants were undertaken because toxemia was the primary cause of maternal deaths in 1949 and the incidence of anemia among pregnant women was 62 percent. Survey findings were the basis for initiating an intensive state-wide nutrition education program.

Nutrition Classes

School surveys have pointed up the need for nutrition education pro-

grams for teachers, parents, and community leaders, Miss Keaton explained. Survey data were useful in initiating nutrition classes among school teachers, parent-study groups, and veterans and their wives, she said. Also, out of these findings came the evident need for nutrition work with lunchroom managers.

Miss Keaton related that a glance at the number of trained dietitians in the State led to investigations of the hospitals' ability to meet their needs for professional help in food service and a plan to include another well-trained dietitian on the nutrition staff who would devote full time to hospitals and institutions. After citing several examples where surveys would have helped, Miss Keaton went on to say that cooperation between health departments and agencies conducting surveys is essential. Information from the agencies should be exchanged and discussed to avoid overlapping of services, she observed.

Washtenaw County Tests Home Safety Devices

"Safe surroundings plus safe practices equal safety in our homes," maintained F. M. Hemphill, Ph.D., associate professor, and Otto K. Engelke, M.D., M.P.H., assistant professor, both of the School of Public Health, University of Michigan.

Home accident prevention activities should be included in routine health department programs, they stated, and economical, educationally sound procedures which are reasonably sure to be successful are now available. Such programs should seek to alleviate the causes of all injuries, they continued, since persons who have frequent minor injuries are apparently also prone to major ones.

They were of the opinion that the success of a home accident prevention program is dependent on understanding of its objectives by all health department personnel and upon their acceptance of and participation in the program. It is im-

portant also, they said, that home safety programs should be made meaningful to homemakers and provide opportunity for their active participation.

In Washtenaw County, they reported, public health nurses have introduced a home safety calendar and accident hazard checklist in 100 selected homes. Experimental in nature, this method illustrated that homemakers and nurses will participate willingly in the attempt to prevent home accidents, they said.

This try-out of devices in Washtenaw County is expected to provide an evaluation of the frequency with which householders recognize home hazards, the reasons for believing things and practices to be hazardous, an indication of classes of things thought to be hazardous, and the number of hazards eliminated or alleviated as a result of the program, they stated. Another factor which may be assessed is the "radial spread" of the safety education program to neighboring homes and homes of contact.

Health a Military Factor In Occupied Territory

In a reminiscent mood, Ira V. Hiscock, Col., MSC, Ret., Sc.D., chairman of the Yale University department of public health, appearing before the Military Government-Civil Affairs Public Health Society described the growth of public health as an important phase of military government.

"The developments during World War II were on a new, fast-moving, and gigantic scale accompanied by broadened concepts in civil affairs," he said in comparing it with his experiences as a non-com in 1918.

Dr. Hiscock, who was chief of the public health section of the War Department's civil affairs division from April 1943 to May 1945, described the early steps taken in 1940 by the United States for a public health program in occupied territory. He said the preliminary plan drawn

up for health protection of troops for possible assignment outside the country became the basis of a syllabus for public health officers in training for civil affairs.

Much early work of a public health nature in liberated areas was done by nonmedical health officers and engineers, he said. Even now, in reserve units, it is questioned whether enough medical officers in proper grade can be found to lead public health teams, he added.

World War II Experience

"We had only a hazy picture of the situation in occupied countries in late 1943," he said. "We were told that over a quarter of a billion people of varied cultural patterns, some enslaved for years, with millions virtually homeless, had been constantly subjected to pestilences, or to threats of epidemics of typhus, and bore emotional scars. They were reported to be either starving or hungry, and experiencing magnified problems of maternity and infancy, of tuberculosis and mortality from many causes.

"The military job in working with those unfortunate people had as a primary focus the military necessity to keep supply lines and communications open and to prevent disorder," he continued.

Dr. Hiscock added: "In fulfillment of this mission, efforts were aimed to help the people of liberated countries to help themselves in getting on their feet, with the idea of turnover of military responsibility at the earliest practicable date."

As part of the public health program, the War Department established a policy to provide supervision of communicable disease control, of maternal and child health measures, of home and hospital nursing services, and for emergency care of sick and injured, he said.

Adequate Personnel

"Qualified personnel is of more significance than the form of organization. There is no single formula for each activity or region; and only

a flexible pattern with basic policies, principles, and techniques can be prescribed in advance. Detailed information concerning each country and region, implemented by practical guides as background, together with brief directives and essential supplies comprise the initial armamentarium required by the qualified civil affairs public health administrator," he said in quoting from a personal memorandum written in 1944.

Current manuals on military government regulations, Dr. Hiscock said, recognize that safeguarding the health of civilians and of occupying troops is vital to reestablishing a war-torn nation.

Health Officer's Job Needs Redefining

Public health activities should follow the needs of the times, and health officers should redefine their place in the community, said Berwyn F. Mattison, M.D., commissioner of the Erie County Department of Health, Buffalo, N. Y.

The definition of the health officer's field of a few decades ago no longer suffices, Dr. Mattison stated. Redefinition is needed to clarify health problems, the techniques for attacking these problems, and the effectiveness of the attack.

"More field studies are needed to establish quantitative relationships between disease and social factors such as age, race, sex, occupation, and economic status," the speaker continued. These factors and their impact on community disease patterns are the health officer's counterpart of the clinician's measurement of a patient's pulse, blood pressure, and basal metabolism, he said. He stated that much of the necessary information is available and that more attention should be given to the data and to their relationship to health and disease.

Barriers Against Disease

Four types of community-wide barriers against disease are avail-

able, the speaker stated. He described these barriers as physical—water filtration, milk pasteurization, air pollution control, and improved housing; physiological—widespread immunization programs, better nutrition, and fluoridation of water supplies; epidemiological—isolation, quarantine, vector eradication, and early case control; and educational—accident prevention, information leading to prevention and early recognition of heart disease and cancer, and promotion of health habits leading to improved physical, emotional, and mental efficiency.

Less emphasis on communicable disease control and more emphasis on positive programs relating to accidents, heart disease, cancer, diabetes, and the degenerative diseases of the elderly are needed today, Dr. Mattison said. More emphasis and less lip service should be given health education, the physician continued. The health officer should understand, direct, evaluate, and take full responsibility for this part of his program and, in addition, should participate actively in community activities, he stated.

Community Leadership

The health officer can provide leadership in his community by working actively for health councils or health committees in councils of social agencies, by teaching at professional, secondary, and elementary school levels, and by seeing that the subject of community disease and public health are well presented, according to Dr. Mattison. This cannot be accomplished, he said, on a 5-day, 40-hour week. "The best-trained health officer is of little value to his locality if his specialized skills are not readily available."

By developing standards for community and service record analysis that will be comparable for all communities, "we should be able not only to justify our current activities but to prognosticate changes in emphasis for the future," the health officer concluded.

Techniques in Health Statistics And Records Management

Methods of following records of veterans to determine the outcome of their disease experience and the technique of covariance were subjects presented at sessions of the statistics section of APHA and the Biometrics Society. At joint sessions of the statistics section, the American Association of Registration Executives, and the American Association of Medical Record Librarians, panel discussions were held of the Census Bureau's post-enumeration survey, a survey of population trends, and the role of the medical record librarian in public health statistics.

Record Follow-Up Methods Developed for Veterans

The techniques developed in a pilot study, conducted for the Veterans Administration in 1948-50 by the Committee on Veterans Medical Problems, National Research Council, provide an efficient and systematic basis for exploiting the unique opportunities for record follow-up in the vast medical experience of armed forces personnel and veterans, reported Bernard M. Cohen, Ph.D., a statistician on the committee.

The committee's program was developed in two parts, the first being clinical studies. The second was record studies, which employed large samples to discover through existing records and by questionnaires facts of mortality, survival, hospitalization, and disability.

The pilot study collected considerable information on tracing and locating resources and on the nature

and value of the facts they can supply, Dr. Cohen said. These data were analyzed to gain more insight into the factors that enhance success in follow-up and to examine questions of completeness, validity, and bias.

He pointed out that in establishing rosters for study, identification of individuals represents a special set of problems. Usually, he said, service serial numbers are received without names, or names without numbers. For further processing, both are required, as well as confirmation that the individual received the diagnosis in question. When follow-up is initiated, files permit further verification of name, serial number, and often diagnosis.

A substantial portion of the observations sought came directly from the Veterans Administration, and the agency also provided most of the leads that resulted in successful tracing. Such additional resources as the Retail Credit Company, the American Red Cross, the Army, other Federal agencies, and private organizations were also used. A questionnaire to those located was especially useful in confirming current survival, in uncovering a few cases of wrong identification, in providing information on hospital admission not federally financed, and in indicating in general terms the health and work status of respondents.

Major Findings

According to Dr. Cohen's summary, the study showed that:

Satisfactory rosters can be defined for a wide variety of conditions and environmental hazards. The six rosters used included a syphilis group; Hodgkin's disease and scarlet fever groups, representing almost the extremes in morbidity and mortality expectations; diabetes and ulcer

groups; and a control group. The syphilis group was from World War I; the others, from World War II.

Identification by matching name, service number, and diagnosis can be accomplished in 96 percent of the cases.

Mortality and survival status can be determined for 99 percent of those identified. This percentage was demonstrated for World War II men approximately 4 years from date of diagnosis. For World War I men, the percentages decreased as the numbers of years from date of diagnosis increased, the lowest percentage being 89.7 after 30 years.

Data on hospitalization can be obtained for an estimated 94 percent of admissions. Veterans Administration records supplied 86 percent of the total admissions reported; the questionnaire, 73 percent.

Veterans Administration disability ratings can be obtained for every case; the veteran's own report of his work status, for 86 percent of the survivors. Comparison of VA disability ratings with clinical investigations of the patient's working capacity at the time of follow-up examination (part of clinical studies also conducted by the committee) indicates that the VA ratings can be used as rough measures of the disability aspect of prognosis.

Post-Enumeration Survey Checks Census Accuracy

The post-enumeration survey of the Census Bureau was described as a quality check on the accuracy of the 1950 census by William N. Hurwitz, M.A., the bureau's chief statistician.

If the major national aggregates for population, housing, and agriculture were the only characteristics to be measured, sample estimates would be more accurate and less costly than a census, Mr. Hurwitz explained. But a census is justified by the data it provides for small geographic areas or for cross-classifications of relatively few people, he said.

As a sample, the monthly current population survey could have been used as a concurrent quality check on the accuracy of the census, but this might have been construed as a "whitewash," and risk loss of public acceptance, he pointed out. Too, there was a possibility that comparing census and survey information for identical households might "condition" results, he said, leading to understating the differences between the census and the sample. As it was, a current population survey, conducted during the census period, checked on only one characteristic—the labor force participation of the population—a changing attribute which could not have been checked following a census, he said.

Post-Enumeration Survey

As a post-census survey, the PES checked on census accuracy in: coverage, age and income distribution, pattern of educational attainment, tenure status of dwelling units, and uses of farm acreage, Mr. Hurwitz reported. It sought to determine if the additional cost of discovering errors were justified, he indicated.

Steps were taken to improve the quality of the PES over the census: the best qualified interviewers and supervisors were trained intensively; they were paid hourly rates to avoid report padding or omission of isolated households; they were instructed to select the best respondent in a household rather than the available respondent, he continued.

PES measured errors in the recording of data and errors of undercoverage and overcoverage. "Any fears that errors of overcoverage due to padding might be substantial were not well-founded for they amounted to less than 0.1 percent of the total people enumerated in the population census," Mr. Hurwitz stated. "This emphasizes the importance of using objective methods for studying sources of errors, rather than relying on impressions," he said.

According to the PES, the net omission rate of persons from the census in enumeration districts

where they should have been enumerated was only 1.4 percent plus or minus 0.2 percent, or about 2 million people plus or minus 340,000, he also stated. "As between urban and rural classes, the under-enumeration seems to be greater in the very large cities and the more rural areas," he added.

Checking the PES

By "checking the check," census statisticians learned of errors in designing PES and in processing results. Interviewers had missed dwelling units. The numbers of missed persons classified by age did not agree with other evidence, he reported. For example, PES findings for missed children under 10 did not agree with an analysis of birth and death statistics for the period 1940–50, he said.

New techniques of treating future under-enumeration problems can come from knowing that about two-thirds of the persons erroneously omitted from the census were in households never included. About a third were missed within enumerated households, mostly among nonmembers of the immediate family, he said.

Mr. Hurwitz described the introduction of "record checks"—using income tax returns, social security records, earlier census reports, industry wage reports, Veterans Administration records to get evidence on the comparative accuracy of response in the PES and the census. "Presumably more accurate information is contained in such records," he stated. All dubious matches are discarded and the balance of matched records is used to draw inferences about errors.

Analysis of Covariance In Analytical Surveys

The analysis of covariance is proposed by B. G. Greenberg, Ph.D., associate professor of biostatistics, University of North Carolina School of Public Health, as a superior alterna-

tive to the usual "adjustment" (for age, sex, etc.) methods used in public health and vital statistics.

The statistical technique is derived from the statistics used in biological and agricultural experiments. Items for which adjustment is usually made are called covariates. Covariance analysis is an extension of regression techniques, associated with the analysis of variance, he said.

According to Dr. Greenberg, the major advantage of the covariance technique is that it enables the researcher to use data more fully. For example, the common adjustment techniques, as for age, require setting up arbitrary groupings even though the data may really be continuous. It is also possible to make proper statistical significance tests using the covariance technique, while there are difficulties in significance testing with adjusted data.

Balancing Technique

Dr. Greenberg also discussed a technique for achieving some of the results given by covariance analysis through balancing of the individuals in an experiment with respect to the covariates. Generally, in public health problems, balancing, or matching, does not achieve results as good as covariance analysis, he said.

He described a development showing that if the study consists of "less than 10 subjects on two treatments, a slight gain in efficiency may be obtained by the technique of balancing." For larger sample size there is little or no gain.

Some limitations in the use of covariance analysis were also discussed by Dr. Greenberg. In addition to the usual assumptions underlying the analysis of variance which are also the assumptions underlying the usual t-test, covariance techniques introduce three further assumptions: linearity of the relation between the covariate and the variate being investigated; equality of regressions in the two groups being studied; uniform variances in the variate studied at different values of the covariate, the usual assumption

of equality of variances in regression problems.

Extension of covariance analysis to more than one covariate was outlined by Dr. Greenberg.

Population Data Valuable In Determining Needs

Recognizing the importance of population data to public health departments, as a means of determining community needs for health services and as the denominator for the computation of vital rates, Mortimer Spiegelman, an associate statistician of the Metropolitan Life Insurance Co., presented a brief survey of population characteristics and trends to a joint session of the statistics section with the American Association of Registration Executives.

Among the points he noted were these:

Age—Perhaps the most significant change during the last decade was the great increase in the number of children, resulting from the war and postwar upsurge in birth rate.

The age group 5 through 19 years increased barely 2 percent between 1940 and 1950, but the present decade will see an increase of about 30 percent.

The age group 20 through 44 years will probably increase by only 2 percent by 1960, but after this date, the group will grow rapidly. Another upswing in the birth curve is expected then.

The population group aged 45 through 64 years will increase by about 18 percent from 1950 to 1960; the number in the age group 65 years and over is expected to increase by about 25 percent.

Sex—At ages 45 and over there were 97 females for every 100 males in 1940, but in 1950 there were 105 females per 100 males. By 1960, the number may mount to as high as 113, thus increasing the problems resulting from widowhood and dependency.

Family—A tendency toward earlier marriage is evidenced by the

increase in the percentage of girls aged 18 and 19 years who are married—from 22 percent in 1940 to 32 percent in 1951.

There were 26 percent more married couples in 1951 than in 1940. The trend toward an increase in the number of families (all groups of two or more related persons living together) and in the number of households and a decrease in the average size of families and of households is likely to continue. However, there is some indication that the long-term downward trend in the average size of completed family, generally defined as the number of births per mother of completed fertility, may have been halted.

Labor force—Industrial health services must be geared to the needs of a growing labor force, an aging labor force, and one that includes an increasing proportion of women workers.

Income—The average family income in 1950 was \$3,300, over 25 percent greater than in 1945. In general, a high average income means not only a better state of health, but also a higher grade of medical and hospital care. Thus, the health department can give proportionately less effort to communicable disease problems and more to chronic diseases.

Education—The task of public health education is great, but the job is being speeded by the rising educational level of the American people. From 1940 to 1947, the proportion of persons 21 years old and over who had completed secondary school rose from one-fourth to more than one-third, and the outlook is that the proportion will rise to more than one-half by 1975.

Migration—The movement of the population to urban places is continuing, bringing an increasing proportion of the population within range of the activities of the public health department. The accompanying shift of the urban population to suburban areas has, however, required an expansion of public health activities.

Urges More Censuses

One of the discussants of this paper, Henry S. Shryock, Jr., Ph.D., assistant chief, population and housing division, U. S. Bureau of the Census, maintained that more frequent population censuses seem the only real answer to community needs.

Dr. Shryock also added a few supplementary facts regarding national population characteristics. He noted that the 2-percent increase cited for children aged 5 through 19 years marks some very divergent changes among the various ages included—an increase of about one-quarter for those aged 5 through 9 years; a decrease of about 4 percent for those aged 10 through 13 years; and a decrease of about one-eighth for those aged 10 through 19 years.

He also mentioned that the marriage rate leveled off in 1952.

Role of Hospital Librarians In Public Health Statistics

The forces bringing hospitals and health departments closer together were noted in a panel discussion of the role of the medical record librarian in public health statistics. This session was moderated by William Haenszel, M.A., director of the bureau of vital statistics, Connecticut State Department of Health.

Responsible for this closer producer-consumer type relationship between hospitals and health departments is the increasing amount of public health data that is available only from hospital records, the participants indicated. The growing practice of locating health department offices adjacent to or even in hospital buildings was pointed to as a visible sign.

Participants in the panel discussion at a joint session of the statistics section, the American Association of Registration Executives, and the American Association of Medical Record Librarians were: James G. Harding, M.H.A., superintendent, Cleveland Clinic Hospital, Marjorie R. Quandt, B.A., director, medical

record department and school, Wesley Memorial Hospital, Chicago; Matthew Taback, A.M., director, bureau of biostatistics, Baltimore City Health Department; and M. Loyola Voelker, B.S., director of medical records section, Public Health Service Hospital, Baltimore.

The panel pointed out, however, that public health statistics are also the concern of hospital associations, medical societies, voluntary health agencies, and schools of medicine and public health. It was stressed that health departments have the responsibility of integrating their requests for hospital data with those of other organizations to ease the burden placed on hospital administrators and record librarians.

Each year, the proportion of births and deaths occurring in hospitals continues to grow in all sections of the country, making the hospital the source of more of the birth and death certificates filed. In the control of chronic diseases, health departments require data now available only in hospital records. With the breaking down of the boundaries between preventive and curative medicine, hospital data will become increasingly important to health departments, the panel brought out.

Clearance of Reports

To achieve completeness and accuracy of reporting, it was suggested that the medical record librarian review and clear all reports submitted to outside agencies. The medical record librarian should be able to establish controls on the receipt of all requests for information, to follow up on their disposition in compliance with hospital practice, and, especially, to check on the quality of information furnished, it was stated.

Although the librarian cannot be expected to obtain all information, it was repeatedly stressed that one of her prime functions was to edit and spot check the reports for accuracy and maintain their quality.

The need for a clearing center was highlighted by a study of the record-keeping procedures in Baltimore hos-

pitals for completing the birth certificate medical supplement. It was found that one or a combination of four types of personnel—obstetrical secretary, resident, or nurse, and attending physician—performed this job. None of these persons had a primary interest in record keeping. Furthermore, the turnover of nurses in residence and the haste of the attending physician contributed to an instability of medical record keeping.

Panel Suggestions

During the discussion, the following suggestions were made:

1. Close cooperation between public health statisticians and medical record librarians is needed. National organizations should appoint committees for combined exploration of their problems, but most of the work should take place on the local level. Local organizations should sponsor workshops and training institutes. Health department statisticians should visit the hospital personnel.

2. Since the academic statistical training of medical record librarians is sketchy, health departments might attain long-run benefits by sponsoring in-service training for medical librarians in elementary statistical principles.

3. State health departments might find it profitable to employ medical record librarians as consultants to assist local health departments in strengthening liaison arrangements with hospitals.

4. Bureaus of vital statistics should send requests for additional clarifying information on hospital births and deaths to the medical record librarian rather than directly to the physician.

5. Health departments should supply hospitals with tabulations and lists of births and deaths occurring within individual hospitals. So far, transmission of data has resembled a one-way street. Tabulation of data of interest to the hospital would stimulate its interest in seeing that the health department receives needed data.

6. A medical record librarian

should lead in educating the medical staff on the importance of reports submitted to health departments by means of orientation lectures to residents and interns, participation in the medical record meetings, and informal instruction.

7. The general acceptance of uniform standards among States on reports required from hospitals, would benefit operations.

8. Health departments should take the initiative in getting together with other users of hospital data to eliminate duplications from their requests and to agree on standard definitions of terms. They should give advance notice of their requirements for an ensuing year and eliminate reports no longer useful or productive.

Hospital Stay Tables Similar to Life Tables

Consideration of some of the inadequacies and limitations of current indexes of hospital stay has suggested the adaptation of life table methodology to hospital statistics, declared Morton Robins, M.P.H., chief, and Rose Sachs, statistician, biometrics section, department of medicine and surgery, Veterans Administration.

The length of stay of patients in hospitals is a major concern of hospital administrators and statisticians, they pointed out. Hospital stay tables similar to life tables in concept and form are designed to present a dynamic and integrated picture of both the hospitalization requirements and the discharge experience of a group of admissions at significant points in time subsequent to their admission.

Outlining two methods of deriving hospital stay tables, they noted that these tables can usually be accomplished within the framework of existing hospital records systems. The employment of hospital stay tables and other biometric techniques can do much to improve and extend the utilization of hospital statistics, they concluded.